Expand Your RAM Space with System 7, Page 118

JUNE 1994

Macworld

THE MACINTOSH® MAGAZINE
$3.95 Canada $4.95

FreeHand

VS

Illustrator

Macworld Grades the Drawing Giants, Page 132

$1820 Power Mac

Test-Proven 60MHz Wonder, Page 56

Top Video-Editing Tools

What You Need for Professional Quality



06
37772
0 130536 4

POWER MACINTOSH RUNS FAST WIT
IN STOCK. JUST WAIT TILL YOU SEE IT



*Offer good only in the 50 United States and Canada. Offer good for purchases after April 1, 1994, and freight charges do apply. © 1994 Microsoft Corporation. All rights reserved. For more information inside the 50 United States, call (800) 434-3976 subsidiary or (206) 936-8661. Microsoft and PowerPoint are registered trademarks of Microsoft Corporation. Macintosh is a registered trademark and Power Macintosh is a trademark of Apple Computer, Inc.

H THE MICROSOFT PROGRAMS NOW WITH OUR PERFORMANCE PACKAGE.



While it's true that the Power Macintosh™ will zip right along with current programs, it'll perform even better with the next version of Microsoft® Office for the Macintosh.®

The programs in the Microsoft Office will not only take advantage of the power and speed of Power Macintosh, they'll also work together. Seamlessly. Effortlessly.

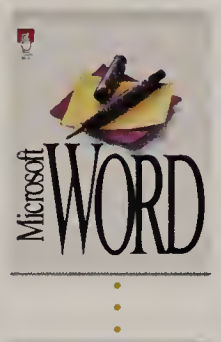
In other words, you'll have a suite of full-featured business programs so well integrated that they act as if they were one program.

But it doesn't stop there. These programs have built-in intelligence that senses what you want to do and helps you do it.

Isn't this something you want?

If so, you really should consider Microsoft Office. Far and away, it's the best way to get the most out of the new Power Macintosh.

But we warn you, you'd better fasten your seat belt.









*Pick up Microsoft Office for Macintosh now. And we'll send you the new version for Macintosh or Power Macintosh at no charge when they ship in the near future.**

Microsoft

Canada, call (800) 563-9048. Outside the U.S. and Canada, call your local Microsoft

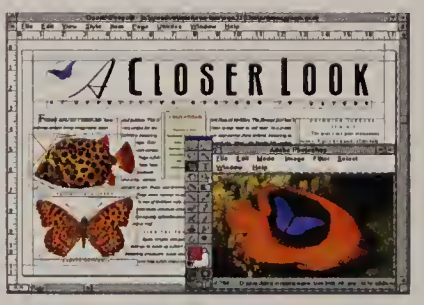


It's time to stop

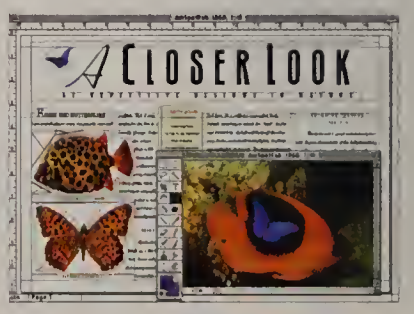
intel inside

You've reached a crossroads in computer technology. A point where choosing between a PowerPC*or a Pentium™ processor-based PC could be a difficult decision.

The PC is not what it used to be. Everything you want to do on a Macintosh*, you can just as easily do on a PC. And now, all of the most popular Mac applications are available for PCs, including those by Aldus, Microsoft, Adobe, Quark and Broderbund.



This is a document created on an Intel-based PC.



This is a document created on a Macintosh.

With Windows,* they're just as easy to use.

And they run at incredible speeds. To put it in

©1994 Intel Corporation.*Other brands and names are property of their respective owners.



and ask directions.

perspective, Intel486™ DX2 processor-based PCs outperform the Mac Quadra* 840av, and Pentium processor-based PCs are even faster.

Best of all, you have a choice of over 100 computer vendors who now offer Pentium processor-based PCs.

These PCs give you access to some of the world's most innovative technologies. Like ProShare™ document and video conferencing. Video software using the Indeo™ format. Even future performance upgrades with the OverDrive™ processor technology.

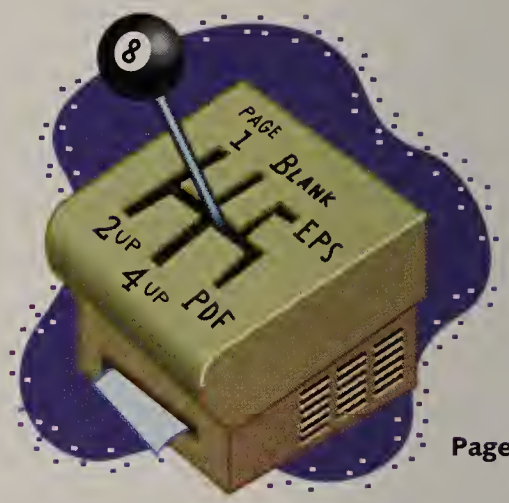
So before you buy another Mac, stop and ask some questions. Find out where Apple is going, especially with the PowerPC. Then ask Intel about the Pentium processor. What you find out might put you on a whole new path.

To learn more about the Pentium processor and other innovative technologies, call 1-800-395-7009, Ext. 111.

intel®

Contents

MACWORLD THE MACINTOSH® MAGAZINE JUNE 1994



Page 145

Features

94 Video-Editing Tools
BY AVI HOFFER Whether you need to create a presentation or an in-house training video, today's editing tools bring professional-quality video in reach.

104 Video Production Techniques
BY MATTHEW LEEDS Step-by-step techniques to make your QuickTime movies look great.

110 PowerBook Power Management
MW LAB
BY CARY LU How do you squeeze every last minute out of your PowerBook's battery? Macworld Lab tests real-life situations to find out.

118 Virtual Memory Realities
MW LAB
BY DAVID POGUE AND GALEN GRUMAN More is often better, but why buy what you don't need? Macworld Lab tests methods that let you get the most out of virtual memory.

News

35 MacBulletin

36 News Apple's future system software plans • Adobe and Aldus to merge • Director 4.0, and more

43 PowerPC News PowerPC 604 chip nears production • Intel fights back with faster Pentium • Power Watch: Who's shipping now, and more

45 New Products



Page 160

Opinion

21 State of the Mac
BY ADRIAN MELLO Is the original Mac design gone for good?

27 Letters

169 The Desktop Critic
BY DAVID POGUE The serial-port multiplier of champions.

173 The Iconoclast
BY STEVEN LEVY The high and low roads to PowerPC.

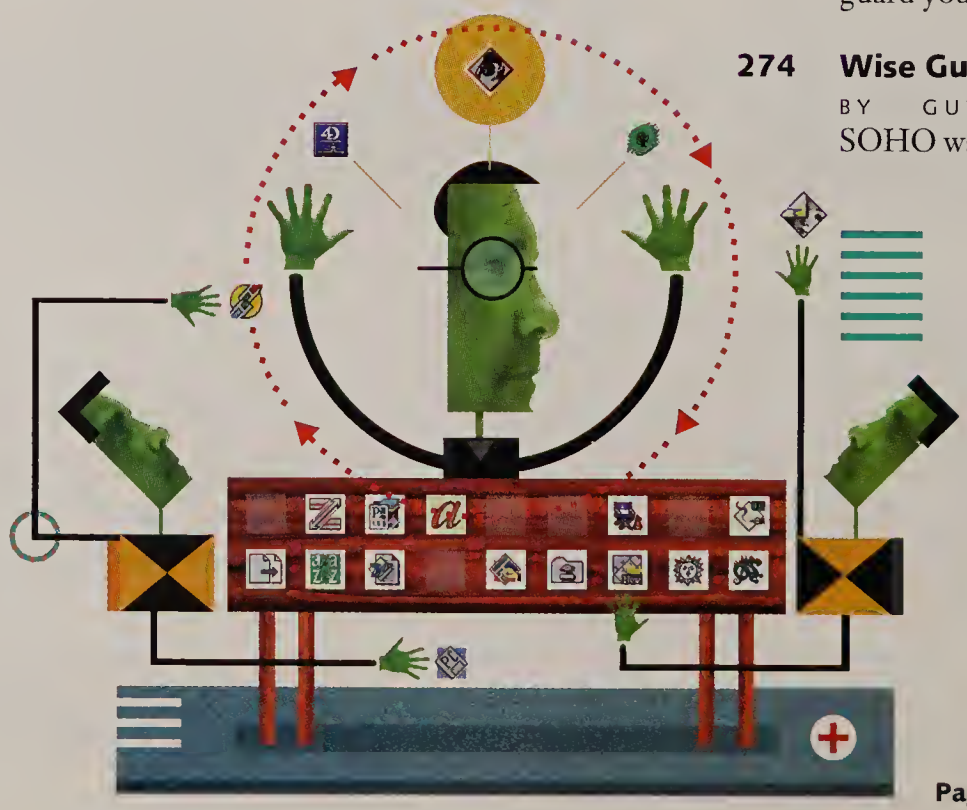
177 Conspicuous Consumer
BY DEBORAH BRANSCUM Fires, floods, earthquakes—how to safeguard your data.

274 Wise Guy
BY GUY KAWASAKI The SOHO warrior.

ON THE COVER

Photo by Stan Musilek.

Tattoo design by Mark Fox.



Page 118



Page 56

Graphics

126 **News** Complete color calibration under $1000 • 30-, 36-bit color flatbed scanners • Illustrator updated for Power Mac, and more

130 **Expert Graphics**
BY CATHY ABES Graphics professionals share their secrets.

132 **FreeHand vs. Illustrator**
BY DEKE McCLELLAND Just how do FreeHand and Illustrator differ? We take a close, feature-by-feature look at how the new versions compare.

Networks

160 **News** Global Village fax, ARA Server • Virus repairs over the network • Power on, power off by phone, and more

163 **PowerBook Notes**
BY CARY LU Managing hard drives and SCSI.

Buyers' Tools

181 **Editors' Choice**
Top picks from our comparative articles.

183 **Star Ratings**
More than 300 product-review summaries.

197 **Streetwise Shopper**
Hardware and software bargains: discounts, bundles, upgrades.



Page 126

At Work

142 **News** In Control adds views, features • New AppleScript-aware agent • Real-time document conferencing, and more

145 **Working Smart**
BY JIM HEID Get the most from LaserWriter 8.

151 **Quick Tips**
BY LON POOLE Tips, tricks, and shortcuts.

14 **How to Contact Macworld**

IDG

June 1994, Volume 11, Number 6 Macworld (ISSN 0741-8647) is published monthly by Macworld Communications, Inc. Editorial and business offices 501 Second St., San Francisco, CA 94107, 415/243-0505. Subscription orders and inquiries should be directed to 303/447-9330. Subscription rates are $30 for 12 issues, $60 for 24 issues, and $90 for 36 issues. Foreign orders must be prepaid in U.S. funds with additional postage. Add $18 per year for postage for Canada and Mexico subscribers. Add $69 per year for postage to all other countries. Second-class postage paid at San Francisco, California, and at additional mailing offices. **Postmaster:** Send address changes to *Macworld*, P.O. Box 54529, Boulder, CO 80323-4529. Printed in the U.S.A.

Reviews

56 **Power Macintosh 6100/60**
Macintosh computer

58 **Macintosh LC 575**
Macintosh computer

59 **Silentwriter 640**
Personal laser printer

60 **DOS Compatible Card for Quadra/Centris 610**
PC coprocessor card

63 **Deck II 2.1**
Digital audio recording software

65 **WriteNow 4.0.1**
Word processor

67 **ClarisImpact 1.0**
Business graphics software

69 **Typestry 2.0**
3-D renderer for type

74 **Resampling Stats 1.0**
Statistics/probability software

74 **SerePlot 2.12**
Scriptable plotting software

77 **TrafficWatch II 2.0**
AppleTalk traffic monitor

77 **VIP BASIC 1.0.1**
Programming language

78 **Managing Your Money 6.0**
Personal-finance program

83 **WillMaker 5.0**
Legal software

83 **Snap Mail 1.01**
Electronic-mail software

84 **DrawingSlate**
Digitizing tablet

84 **Notebook Printer II**
Portable printer

86 **FlipBook 1.0**
Animation printing tool

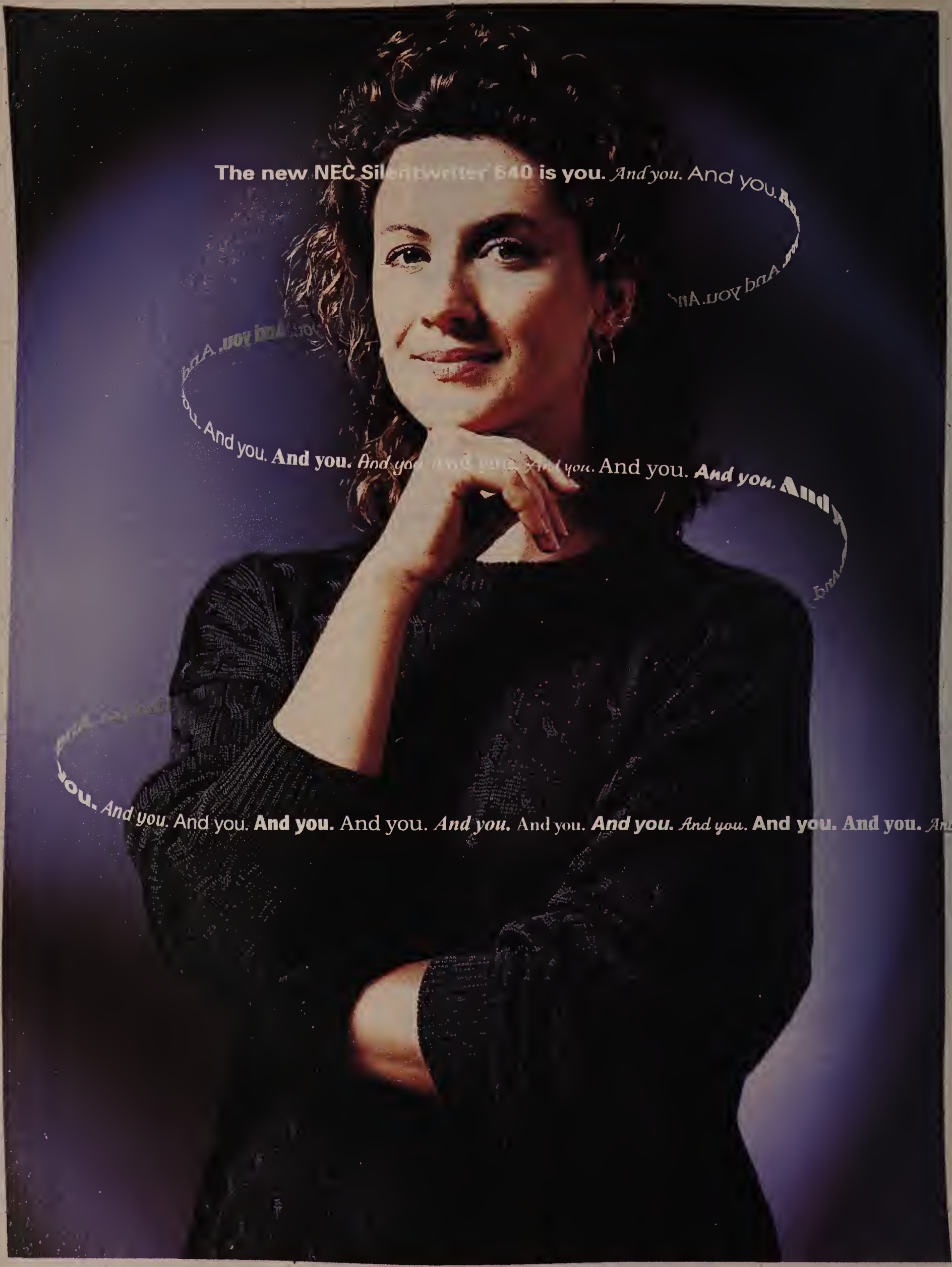
86 **UnderWare 1.0.1**
Screen saver/desktop enhancer

88 **SimCity 2000**
Simulation game

88 **Crystal Crazy**
Arcade game

90 **Firefall Arcade**
Arcade-style game

90 **Spin Doctor**
Arcade game



Silentwriter is a registered trademark of NEC Corporation. All other trademarks and registered trademarks are the property of their respective holders. The Energy Star emblem does not represent EPA endorsement of any product or service. Specifications subject to change without notice. NEC USA #GSOUK91A0555241. © 1993 NEC Technologies, Inc.

Our new personal Mac® laser printer lets you say what you want to say, exactly the way you want to say it. That's because it's a true laser printer with 300 dpi resolution, along with our patented Sharp Edge Technology and Microfine toner, for crisper characters and richer, darker blacks.

And because it comes with 17 resident Adobe™ Type 1 fonts, 35 professional TrueType™ fonts, and built-in TrueType and Type 1 rasterizers.

It's loaded in other ways, as well. It has Adobe PostScript™ Level 2, so it works beautifully with any application. NEC's 6ppm print engine. 3 MB of standard RAM. And an AppleTalk® interface, for quick and easy connectivity with one or several Macs.

It also gives you what no one else does: a 2-year limited warranty that will get you a replacement printer *overnight,* if anything goes wrong. All for about $800.

For more information, call 1-800-NEC-INFO. Or, for information via fax, 1-800-366-0476, and request document #79640. Thank you. And you. And you.

you. And you. **And you.** ***And you.*** And you. ***And you.*** And you. **And you.** ***And you.*** **And you.** ***And you.*** ***And you.***



POSTSCRIPT Software from Adobe

energy star EPA POLLUTION PREVENTER

NEC

Circle 25 on reader service card



AnthroCarts®!

AnthroCarts will knock your socks off! Imagine how great it'll be when you find the perfect furniture for your equipment — just the right size, tough as nails construction and dozens of accessories.

And you'll find our service so real and responsive, you'll get a kick out of ordering direct!

Call for a free catalog!



Lifetime Warranty.



Adjustoble for all sizes.



Lots of choices.

ANTHRO®

800-325-3841

3221 NW Yeon St.
Portland, OR 97210
Fax: (800)325-0045

GSA contract no. GS-00F-5040A. Avoilable for OEM applications. Prices from $159.00
Anthro, AnthroCart and Technology Furniture ore registered trodemorks of Anthro.

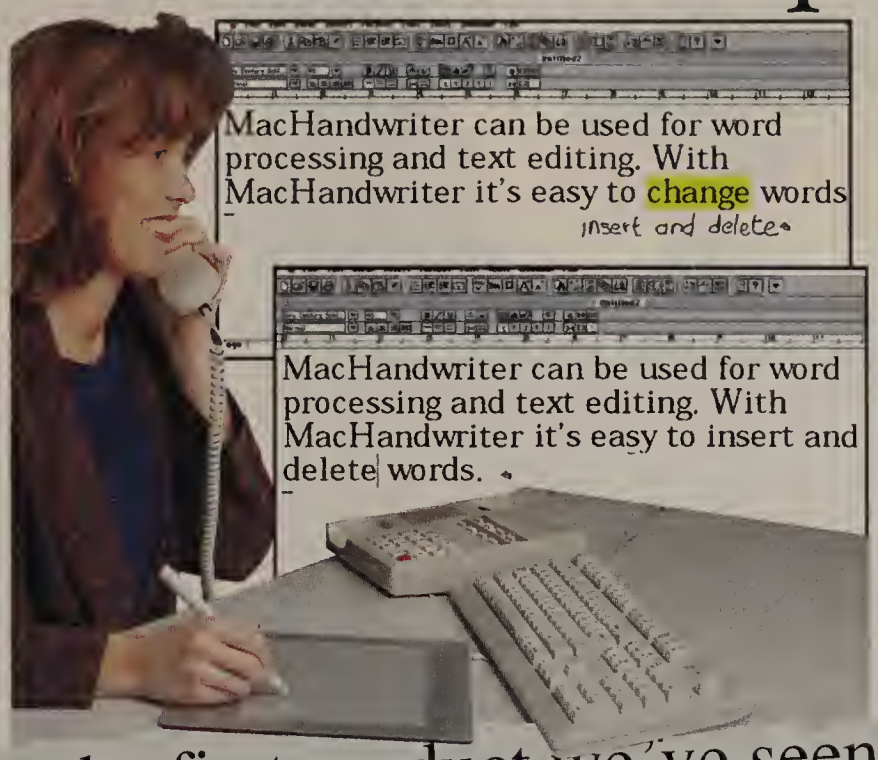
Macworld

PRESIDENT/CEO AND PUBLISHER MACWORLD COMMUNICATIONS, INC.	James E. Martin
ASSISTANT TO THE PRESIOENT	Leta C. Fisher
CHIEF OPERATING OFFICER MACWORLO MAGAZINE	Colin Crawford
ASSISTANT TO THE COO	Yuen Yeh
DIRECTOR OF FINANCE	Vicki Peilen
OIRECTOR OF HUMAN RESOURCES	Shelly Ginenthal
DIRECTOR OF CORPORATE INFORMATION SYSTEMS	Walter J. Clegg
INFORMATION SYSTEMS MANAGER	Rick Valdez
CORPORATE BUSINESS MANAGER	Christina W. Spence
ACCOUNTING/OPERATIONS MANAGER	Pat Murphy
ACCOUNTING/FACILITIES MANAGER	Michelle Reyes
SENIOR FINANCIAL ANALYST	Madeleine Buckingham

MACWORLD is a publication of International Data Group, the world's largest publisher of computer-related information and the leading global provider of information services on information technology. International Data Group publishes over 194 computer publications in 62 countries. Forty million people read one or more International Data Group publications each month. International Data Group's publications include: **ARGENTINA'S** Computerworld Argentina, Infoworld Argentina; **ASIA'S** Computerworld Hong Kong, PC World Hong Kong, Computerworld Southeast Asia, PC World Singapore, Computerworld Malaysia, PC World Malaysia; **AUSTRALIA'S** Computerworld Australia, Australian PC World, Australian Macworld, IDG Sources, Reseller, Network World, Mobile Business Australia; **AUSTRIA'S** Computerwelt Oesterreich, PC Test; **BELGIUM'S** Data News (CW); **BRAZIL'S** Computerworld, Game Power, Super Game, Gamepro, Mundo IBM, Mundo Unix, PC World; **BULGARIA'S** Computerworld Bulgaria, Ediworld, PC & Mac World Bulgaria, Network World Bulgaria; **CANADA'S** Direct Access, Graduate Computerworld, InfoCanada, Network World Canada; **CHILE'S** Computerworld, Informatica; **COLOMBIA'S** Computerworld Colombia; **CZECH REPUBLIC'S** Computerworld, Elektronika, PC World; **DENMARK'S** CAD/CAM WORLD, Communications World, Computerworld Danmark, LOTUS World, Macintosh Produktkatalog, Macworld Danmark, PC World Danmark, PC World Produktguide, Windows World; **ECUADOR'S** PC World; **EGYPT'S** Computerworld Middle East, PC World Middle East; **FINLAND'S** MikroPC, Tietoviikko, Tietoverkko; **FRANCE'S** Distributique, Golden Mac, InfoPC, Languages & Systems, Le Guide du Monde Informatique, Le Monde Informatique, Telecoms & Reseaux; **GERMANY'S** Computerwoche, Computerwoche Focus, Computerwoche Extra, Computerwoche Karriere, Information Management, Macwelt, Netzwelt, PC Welt, PC Woche, Publish, Unit; **GREECE'S** Infoworld, PC Games; **HUNGARY'S** Alaplap, Computerworld SZT, PC World, PC Virlag; **INDIA'S** Computers & Communications; **IRELAND'S** Computerscope (Computerworld); **ISRAEL'S** Computerworld Israel, PC World Israel; **ITALY'S** Computerworld Italia, Lotus Magazine, Macworld Italia, Networking Italia, PC World Italia; **JAPAN'S** Information Systems World, Computerworld Today, Nikkei Personal Computing (PCW), Macworld Japan, SunWorld Japan, Windows World; **KENYA'S** East African Computer News; **KOREA'S** Computerworld Korea, Macworld Korea, PC World Korea; **MEXICO'S** Compu Edicion, Compu Manufactura, Computacion/Punto de Venta, Computerworld Mexico, MacWorld, Mundo Unix, PC World, Windows; **THE NETHERLANDS'** Computable (CW), Computer! Totaal, LAN Magazine, MacWorld; **NEW ZEALAND'S** Computer Listings, Computerworld New Zealand, New Zealand PC World; **NIGERIA'S** PC World Africa; **NORWAY'S** Computerworld Norge, C/world, Lotusworld Norge, Macworld Norge, Networld, PC World Ekspress, PC World Norge, PC World's Product Guide, Publish World, Student Data, Unix World, Windowsworld, IDG Direct Response; **PANAMA'S** PC World Panama; **PERU'S** Computerworld Peru, PC World; **PEOPLE'S REPUBLIC OF CHINA'S** China Computerworld, China Infoworld, China Network World, PC World China, IDG Shenzhen's Computer News Digest, Electronics International, IDG HIGH TECH Beijing's New Product World; **PHILIPPINES'** Computerworld, PC World; **POLAND'S** Computerworld Poland, PC World/Komputer; **PORTUGAL'S** Cerebro/PC World, Correio Informatico/Computerworld, MacIn; **ROMANIA'S** PC World, Computerworld; **RUSSIA'S** Computerworld-Moscow, Mir-PC, Sety; **SLOVENIA'S** Monitor Magazine; **SOUTH AFRICA'S** Computing S.A., Network World S.A., Computer Mail; **SPAIN'S** Amiga World, Computerworld Espana, Communicaciones World, Macworld Espana, NextWorld, PC World Espana, Publish, Sunworld, Super Juegos Magazine (GamePro); **SWEDEN'S** Attack, ComputerSweden, Corporate Computing, Lokala Natverk/LAN, Lotus World, MAC&PC, Macworld, Mikrodatorn, PC World, Publishing & Design (CAP), Datalngenjoren, Maxi Data, Windows World; **SWITZERLAND'S** Computerworld Schweiz, Macworld Schweiz, PC & Workstation, PC Katalog; **TAIWAN'S** Computerworld Taiwan, Global Computer Express, PC World Taiwan, **THAILAND'S** Thai Computerworld, **TURKEY'S** Computerworld Monitor, Macworld Turkiye, PC World Turkiye; **UKRAINE'S** Computerworld; **UNITED KINGDOM'S** Computing/Computerworld, Connexion/Network World, Lotus Magazine, Macworld, Sunworld; **UNITED STATES'** AmigaWorld, Cable in the Classroom, CD Review, CIO, Computerworld, Desktop Video World, DOS Resource Guide, Electronic Entertainment Magazine, PlayRight, Power PC World, Federal Computer Week, Federal Integrator, GamePro, IDG Books, InfoWorld, InfoWorld Direct, Laser Event, Macworld, Multimedia World, Network World, NeXTWORLD, PC Letter, PC World, Publish, SunWorld, SWATPro, Video Event, **VENEZUELA'S** Computerworld Venezuela, Micro-Computerworld Venezuela, **VIETNAM'S** PC World Vietnam.

MacHandwriter® Named "Best" In Pen Computing

MacHandwriter — the all-in-one, plug-and-play input device for entering graphics, text and commands — was named by *MacWeek* as one of MacWorld's "must see" products. The PC version has been acclaimed by everybody from *Windows Sources* to *PC Computing*. Now *you* can join thousands of satisfied customers who took us up on our satisfaction-or-your-money-back offer* to see how it can supercharge *your* desktop computer.



Ask A Friend For A Demo!

Whether it's on a Mac or a PC, you probably know someone who owns a CIC Handwriter® product. Why not ask him or her to give you a demonstration? We've delivered thousands since volume shipments began this year, and we cordially invite you to take us up on our satisfaction-or-your-money-back offer.

Take advantage of our Handwriter Referral Program and make it worth your friend's while. When you order, give us the name of the person who showed you their CIC product, and we'll send your friend a free CIC T-Shirt.

The Ultimate Editing Tool

You spend at least 80% of your document-creation time editing.

Give me an ample amount of time

Give an ample amount of time

Imagine high-lighting, changing words with gestures you already know, moving text, spell-checking, pointing and clicking with one device. MacHandwriter will make your pen the ultimate keyboard complement.

the first product we've seen that makes pen computing seem exciting, viable, and even fun.

Windows Sources, April 1994

Ultimate Graphics



Michelangelo didn't create his Sistine Chapel masterpiece with a ball peen hammer. Why constrain your own creativity with a mouse? MacHandwriter lets you easily draw or trace and works perfectly with your existing graphics software. *And* it reads your writing!

What Do The Experts Say?

Companies Offering CIC Recognition Technology:

Apple/Japan	NEC
AT&T	Samsung
Dauphin	Seiko Epson
Fujitsu	Symbol Technology
IBM	Toshiba
MicroSlate	and others

"*... and its handwriting recognition is the best we've ever seen.*"
March 1994, *PC Computing*

"*We found it to be fast and highly accurate — easily the best recognition engine we've tested ... Perhaps the most versatile input device available.*"
April 1994, *Windows Sources*

"*... accepts human handwriting in a way that runs circles around Newton, Zoomer or EO.*"
January 1994, *Chicago Tribune*



The Ultimate Physical Therapist

Tired of hurting, sitting in a rigid, cramped position using the mouse? Are you really getting paid enough to suffer? 56% of all OSHA reported injuries are RSI, or Repetitive Stress Illnesses. The recommended physical therapy for wrist and tendon problems is making a fist. Kind of like you'd do holding a pen. MacHandwriter is a healthy complement to your keyboard.

MacHandwriter Includes ...

... our number-one ranked Handwriter Recognition System® — the PenMac™ state-of-the-art operating environment — a cordless electronic pen and an ultra-thin/ultra-light tablet with a ten-foot cord for connection to your Mac's ADB port. It also comes with 30 crossword puzzles (and a way to order more), and our no-nonsense return privilege.

MacHandwriter®
THE CREATIVITY TOOL

Will Change Your Life Or Your Money Back.

~~$399~~ $299.
Until July 15, 1994
Mac or PC Versions
Buy From Your Local Dealer
Or Call CIC Direct:
800-888-9242
extension 5026

415-802-7888 from outside the U.S.
Or FAX 415-802-7777

Communication Intelligence Corporation
NASDAQ/NMS CICI

CIC.

*You may return your MacHandwriter within 30 days for a full refund, provided it is in resalable condition.

©1994 by CIC. MacHandwriter, Handwriter Recognition System and PenMac are trademarks of Communication Intelligence Corporation. All other trademarks acknowledged.

TRBA

UNFORGETTABLE.



Image shown is an actual nVIEW LCD image.

THE *n*VIEW® Z SERIES.

They won't forget your message. You won't forget the applause. Project your next presentation directly from your computer in big, bold color images with *n*VIEW's new line of LCD projection panels.

Sleek, feather-light panels that are so easy to use, yet so durable, you can deliver presentations anywhere, anytime. With impact.



All-in-one projection panels are easy to setup with built-in audio, unique Presentation Control and the versatility to connect up to four sources simultaneously.

See it. Hear it. Feel it. Unforgettable presentations everytime.

Enjoy the applause!

For more information call **1-800-736-8439** or **804-873-1354**.

*n*VIEW
VISIONARY DISPLAY TECHNOLOGIES

nVIEW products are manufactured under U.S. Patent #4,763,993; #4,976,536; #5,153,621; #5,150,238; #5,277,871; and 5,255,029. Other and foreign patents pending. nVIEW and ViewFrame are registered trademarks and MediaPro, Luminator and nSIGHT are trademarks of nVIEW Corporation.

Put Our List On Your List

Our list is the *Consumer Information Catalog*. It's free and lists more than 200 helpful government booklets. So send for the free *Catalog*. It's the thing to do. Write:

Consumer Information Center, Dept. LL, Pueblo, CO 81009

A public service of this publication and the Consumer Information Center of the U.S. General Services Administration

Circle 117 on reader service card

Macworld

EDITOR-IN-CHIEF Adrian Mello

EDITORIAL

EXECUTIVE EDITOR Deborah Branscum
SENIOR EDITOR/FEATURES Dan Muse
SENIOR EDITOR/REVIEWS Carol Person
LAB MANAGER Lauren L. Black
DIRECTOR OF EDITORIAL OPERATIONS Jane Lagas
SENIOR ASSOCIATE EDITOR/FEATURES Galen Gruman
SENIOR ASSOCIATE EDITOR/GRAPHICS James A. Martin
SENIOR ASSOCIATE EDITOR/FEATURES Charles Piller
ASSOCIATE EDITOR/GRAPHICS Cathy E. Abes
ASSOCIATE EDITOR/REVIEWS Marjorie Baer
ASSOCIATE EDITOR/NETWORKS Elizabeth Dougherty
ASSOCIATE EDITORS/LAB Mark Hurlow, Tim Warner
ASSOCIATE EDITOR/AT WORK Dan Littman
ASSOCIATE EDITOR/NEWS Tom Moran
ASSISTANT EDITOR Suzanne Courteau
ASSISTANT EDITOR/NEW PRODUCTS Cameron Crotty
ASSISTANT EDITOR/REVIEWS Wendy Sharp
ASSISTANT EDITORS/LAB Matthew R. Clark, Danny Lee
EDITORIAL ASSISTANTS Jim Feeley, Joanna Pearlstein
ADMINISTRATIVE ASSISTANTS Matthew Hawn, Lyn Taylor
ASSISTANT TO THE EDITOR-IN-CHIEF Susan P. Grant-Marsh
CONTRIBUTING EDITORS Robert C. Eckhardt, Erfert Fenton, Jim Heid, Guy Kawasaki, Steven Levy, Cary Lu, Deke McClelland, Tom Negrino, David Pogue, Lon Poole, Steve Roth, Charles Seiter, Suzanne Stefanac, Franklin N. Tessler

INTERNATIONAL EDITORS

Osmund Iversen, Australia, 011 61 2 439-5133;
Marianne Fajstrup, Denmark, 011 4536 44 28 00;
Michael Thevenet, France, 011 33 1 49 04 79 00;
Stephan Scherzer, Germany, 011 49 89 3 60860;
Enrico Lotti, Italy, 011 39 2 58 011660;
Osamu Honma, Japan, 011 81 3 5276-0541;
Shin Cho, Korea, 011 82 2 579-8031;
Paul Molenaar, Netherlands, 011 31 23 354554;
Toralv Ostvang, Norway, 011 472 264 7725;
Alvaro Ibariez, Spain, 011 34 1 319 4014;
Nicklas Mattsson, Sweden, 011 46 8667-9180;
Roger Bataillard, Switzerland, 011 41 1 55 1077;
Cemal Balci, Turkey, 011 90 1 279 1180;
Peter Worlock, United Kingdom, 011 4471 831-9252

COPY EDIT AND EDITORIAL PRODUCTION

MANAGING EDITOR Charles Barrett
ASSISTANT MANAGING EDITOR Ruth Henrich
EDITORIAL PRODUCTION MANAGER Jeff Sacilotto
SENIOR COPY EDITOR Katherine L. Ulrich
COPY EDITORS D. Jacqueline Kan, Paul Michael King
PRODUCTION EDITORS Lisa Brazieal, Doreen Engelmann

ART AND DESIGN

DESIGN DIRECTOR Dennis McLeod
ART DIRECTOR Joanne Hoffman
SENIOR DESIGNER Leslie Barton
SENIOR DESIGNER/INFORMATIONAL GRAPHICS Arne Hurty
ASSOCIATE ART DIRECTOR Kent Tayenaka
ASSISTANT ART DIRECTOR Sylvia Benvenuti
DESIGNER Hae Yuon Kim
ASSOCIATE DESIGNER Tim Johnson
SENIOR DESIGN ASSOCIATE Martha Katt
DESIGN ASSOCIATE Belinda Chlouber



OWN 100 EXOTIC CARS!

100 photographs of Exotic Cars on CD-ROM can be yours with Corel Professional Photos series 29000.

Other categories:

- 1000 - Sunrises and Sunsets
- 2000 - Mountains of America
- 3000 - WW II Planes
- 4000 - Porsche Racing
- 5000 - Coasts
- 6000 - Wild Animals
- 7000 - Sailboats
- 8000 - Birds
- 8100 - Birds II
- 9000 - Trees and Leaves
- 10000 - Air Shows
- 11000 - Patterns
- 12000 - Underwater Reefs
- 13000 - Flowers
- 13100 - Flowers II
- 14000 - The Arctic
- 15000 - China and Tibet
- 16000 - Rural Africa
- 17000 - Ireland
- 18000 - Western Canada
- 19000 - Arizona Desert
- 20000 - Spirit of Buddha
- 21000 - Auto Racing
- 22000 - Bridges
- 23000 - People
- 24000 - Churches
- 25000 - Food
- 26000 - Lakes and Rivers
- 27000 - Waterfalls
- 28000 - Fields
- 30000 - Egypt
- 31000 - Residential Interiors
- 32000 - Deserts
- 34000 - Aviation Photography
- 35000 - Insects
- 35100 - Insects II
- 36000 - New Zealand
- 36100 - New Zealand II
- 37000 - Fighter Jets
- 40000 - Fireworks
- 42000 - Predators
- 43000 - Waterfowl
- 44000 - Alaska
- 45000 - Underwater Life
- 46000 - Hawaii
- 47000 - Turkey
- 47100 - Turkey II
- 48000 - Northern California
- 49000 - Apes
- 50000 - California Parks
- 51000 - Cactus Flowers
- 52000 - Butterflies
- 53000 - Mexico City
- 54000 - New Mexico
- 55000 - Korea
- 56000 - Sacred Places
- 57000 - Old Singapore
- 58000 - Guatemala
- 59000 - Doors of San Francisco
- 60000 - Skiing in Switzerland
- 61000 - Ski Scenes
- 62000 - Windsurfing
- 63000 - Commercial Construction
- 64000 - Mexico

and many more...

COREL PROFESSIONAL PHOTOS CD-ROM

- 100 Royalty Free Images
- Kodak Photo CD Format
- Mac & PC Compatible
- Ideal for Desktop Publishing
- Corel Screen Saver & Utilities

COREL® 1-613-728-3733 EXT.106

The World's Leading Photo CD-ROM Collections

from the makers of CorelDRAW, the world's best-selling graphics software.

OVER 160 STUNNING CATEGORIES AVAILABLE!

Great as screen savers or stock photography.
Ideal for ads, brochures, presentations and multimedia.
Use CorelDRAW to retouch or add special effects.

DTP direct DESKTOP PUBLISHING CATALOG

$29.00 U.S. funds EACH CATEGORY

1•800•395•7778

SERIOUS GRAPHICS SOFTWARE & HARDWARE

MICROSOFT® WINDOWS™ COMPATIBLE

PC Multimedia PC

Macintosh

Most all utilities are available for Macintosh. All logos and wordmarks trademarks, registered trademarks and certification marks are the property of their respective companies



KUR-0043-CARS

100 SUPERB IMAGES IN EACH COLLECTION!

$ ATTENTION $ PROFESSIONAL PHOTOGRAPHERS!

If you are a professional photographer interested in having Corel publish your photographs, please call the number below for more information.

CALL: (613) 728-8200 ext. 5080

Circle 78 on reader service card

"The Best Mac Desk Ever."

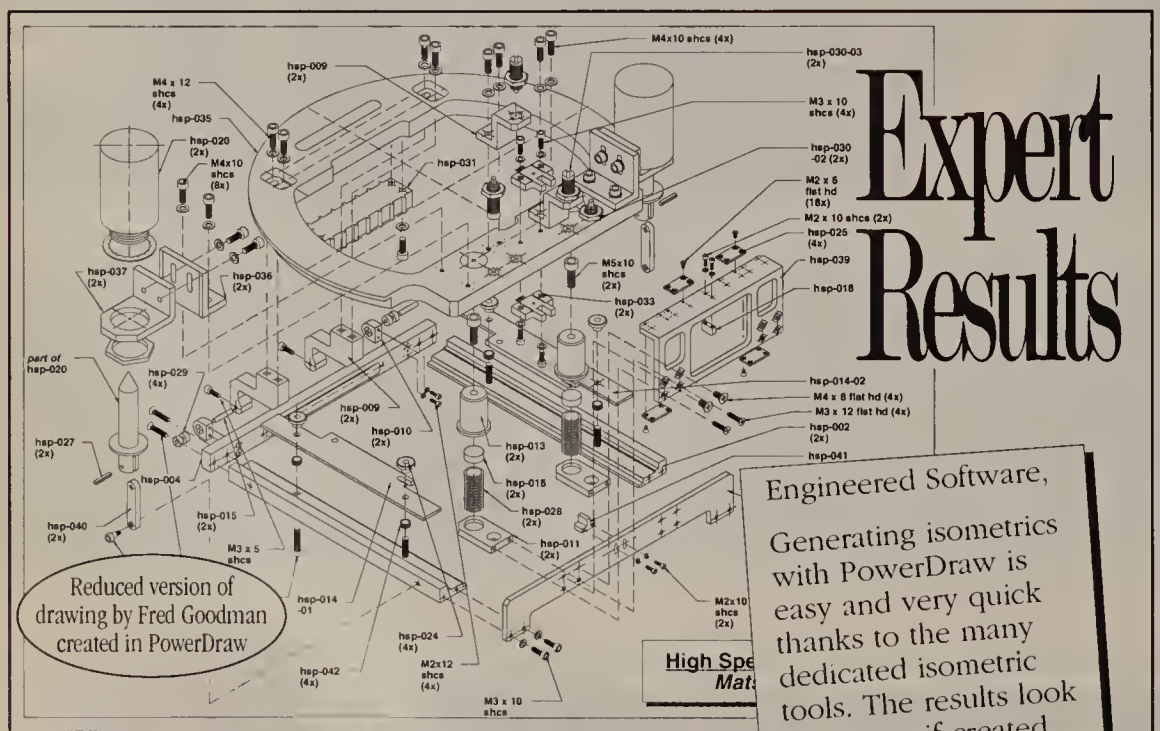


- Ergonomic
- Fully Adjustable
- Strong
- Guaranteed
- VAR Inquiries Welcome

agio™
BEAVERTON, OREGON

Free Catalog! 800.688.2446

| Phone 503. 690.1400 | FAX 503. 690.1423 | Europe 011.41.62.631026 | Japan 011.81.3.3583.0436 |



Expert Results

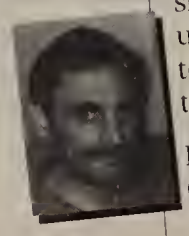
Engineered Software,

Generating isometrics with PowerDraw is easy and very quick thanks to the many dedicated isometric tools. The results look sharp—as if created using time-honored technical illustration techniques!

PowerDraw does for CAD what the Mac did for computers.

Sincerely,
Fred Goodman

PowerDraw™
IN 41 COUNTRIES AROUND THE WORLD



1990 HONORABLE MENTION MacUser

MACWORLD MW EDITORS' CHOICE Jan. 1993

ENGINEERED SOFTWARE™

CALL 910-299-4843 OR FAX 910-852-2067 • IN CANADA 204-453-8111

Macworld

ADVERTISING SALES

VICE PRESIDENT/ASSOCIATE PUBLISHER	Shannon D. Dolan (415/243-0505)
BUSINESS MANAGER/AD SALES	Lisa Buckingham (415/974-7344)
NO. CALIFORNIA (SAN JOSE, SOUTH)	Cherie La France (415/978-3276)
SALES ASSOCIATE	Nazy Farhang (415/978-3257) Marilu Stuart (415/978-3164)
NO. CALIFORNIA (MARIN), WASHINGTON, OREGON, WESTERN CANADA	Stephen McGill (415/978-3155)
SALES ASSOCIATE	Edward Ramirez
SOUTHWEST REGIONAL MANAGER	Nancy Coy (714/250-1307)
SO. CALIFORNIA	Cathi T. Bledsoe Molly Shank
EASTERN/MIDWEST REGIONAL MANAGER	Joan Kelly (508/872-8600)
NEW ENGLAND, FLORIDA	Paul Bonarrigo
SALES ASSOCIATE	Luanne Newman
MIDWEST/TEXAS	Lisa Ladle (708/827-4477)
SALES ASSOCIATE	Kathy Poppenhagen
MID-ATLANTIC/SOUTHEAST	Annette Osnos (201/587-0090)
SALES ASSOCIATE	Cathy Langhaar
MANAGER DIRECT RESPONSE SALES	Beverly Schneider (415/978-3138)
ACCOUNT MANAGERS/MAIL ORDER	Marsha K. Bowers (415/974-7413) Wendi A. Smith (415/978-3117)
MACWORLD SHOPPER	Niki Stranz (415/978-3105), Carol Johnstone (415/978-3152), Shannon Smith (415/974-7414)

MACWORLD GLOBAL PRODUCT SUPPORT CENTER

DIRECTOR OF MARKETING AND COMMUNICATIONS	Kimberlee A. Luedee
TECHNICAL MANAGER	Chip Carman

MARKET RESEARCH

VICE PRESIDENT/DIRECTOR OF RESEARCH	Gary L. Rocchio
MARKET RESEARCH MANAGER	Linda Lawrence
RESEARCH SERVICES COORDINATOR	Jason Douglas

MARKETING

MARKETING DIRECTOR	Cynthia Koral
MARKETING MANAGER	Anne Nichols
PROMOTION MANAGER	Lisa McKeon
MARKETING COORDINATOR	Rhona Hamilton

CIRCULATION

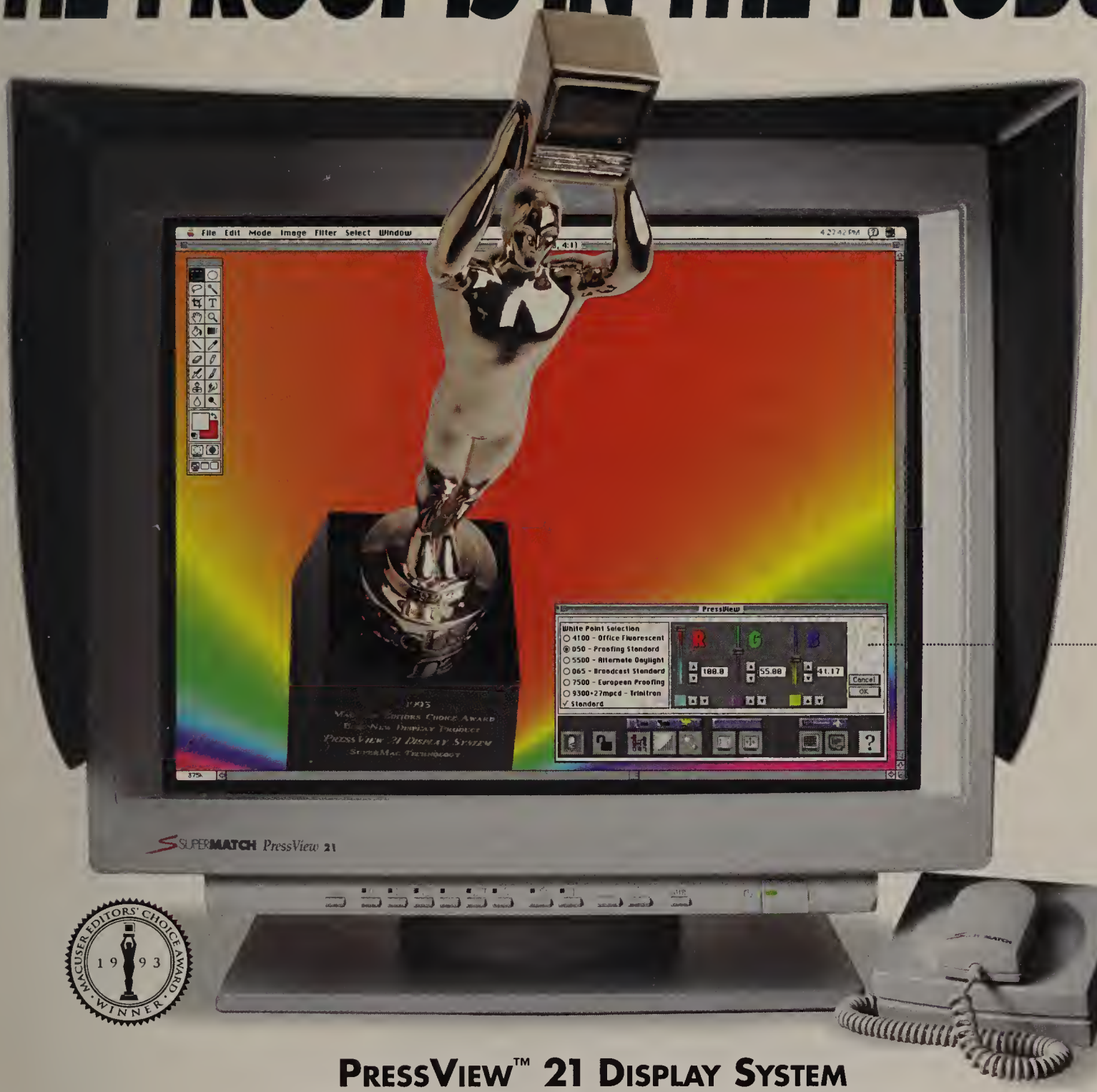
DIRECTOR OF CIRCULATION	Angelina Beitia
SINGLE-COPY SALES DIRECTOR	George Clark
CIRCULATION MANAGER	Lori Hitchcock
NEWSSTAND SALES MANAGER	Martin Garchar
SUBSCRIPTION MANAGER	Elizabeth Jensen
DIRECT MARKETING MANAGER	Jenifer Carini
PROMOTION MANAGER	Kelvin Gee
NEWSSTAND COORDINATOR	Dalia Schwartz
SUBSCRIPTION COORDINATOR	Deirdre Dugan
SUBSCRIPTION INQUIRIES	800/288-6848

PRODUCTION

VICE PRESIDENT/DIRECTOR OF MANUFACTURING	Anne Foley
PRODUCTION MANAGER	Cynthia Mazzola
BILLING INFORMATION MANAGER	So Fong Yip
AD TRAFFIC COORDINATOR	Shellie Anderson
DTP COORDINATOR	Clayton Haberman

Circle 12 on reader service card

THE PROOF IS IN THE PRODUCT



PressView™ 21 Display System
1993 *MacUser* Eddy Award Winner

Now You Can Control the Way You See Color!

Control Color Viewing

PressView 21 offers a calibrated 5000° Kelvin white point, delivering natural daylight colors on your display for accurate and consistent color and letting you better match what you see printed on paper.

Designed exclusively for SuperMac by Hitachi, PressView 21 offers high-resolution viewing — up to 1360 x 1024 — with nearly 40-percent more viewable work area than most other 21" displays.

Control With Calibration

PressView includes the SuperMatch™ Calibrator Pro tristimulus colorimeter for highly accurate display calibration. Because the calibrator updates the display control software, as well as your color management software, you'll know that your settings are accurate and up to date.

Control Proofing Costs

Now you can save time by preproofing on the screen — and save money by reducing the use of costly proofing materials.

The Computer Is in the Display

PressView 21 Display System gives you the ultimate in control over color settings and screen geometry. Your Macintosh® computer communicates directly to the computer inside PressView 21 via a standard serial connection.

PressView software lets you customize, save, and restore display settings. The ColorSentry™ password security system ensures your settings won't be altered accidentally.

For the nearest Authorized Reseller, call: **(800) 334-3005**
For information via fax, call: (800) 541-7680

SUPERMAC™
The SuperSource for Color

© 1994 SuperMac Technology, Inc. All rights reserved. The SuperMac logo, the SuperMac stylized "S," ColorSentry, PressView, and SuperMatch are trademarks of SuperMac Technology, Inc. Macintosh is a registered trademark of Apple Computer, Inc.

Circle 88 on reader service card

After All These Years–Better Than Ever!

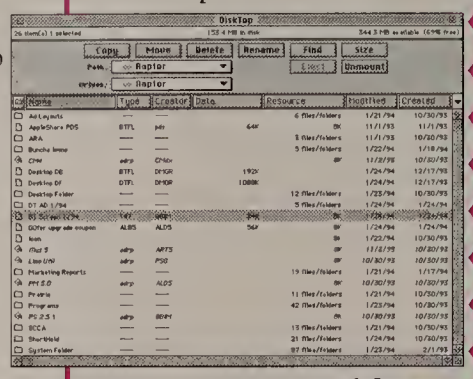
VERSION 4.5

These days *every* Mac has a hard drive. And every hard drive needs ***NEW DiskTop™ 4.5!*** It finds, copies, moves, renames, deletes, sorts and launches files and applications quickly and easily. The "Find" function is a thing of beauty. DiskTop finds by date created or modified, size, type, creator, name or any combination. Search drives, CDs, cartridges, opticals, network drives . . . everywhere! Retain found items and launch, copy, move, rename or delete them. It's faster and smarter than Apple's "find" routine. Set up the new "jump to" submenu to get to frequently used folders instantly.

NEW DiskTop 4.5 also lets you create aliases and save them into any location.

DT Launch, included, creates a menu with programs or files that you can launch in an instant, anytime, anywhere.

NEW DiskTop 4.5 is ideal for novices or power users alike.



Got a Mac? You need ***DiskTop 4.5*** – the international award-winning file management tool.

For info on DiskTop 4.5, how to upgrade or other PrairieSoft, Inc., products, see your local retailer or call us at 515.225.3720.

PRAIRIESOFT SOFTWARE

©1994 PrairieSoft, Inc. West Des Moines, IA. DiskTop is a trademark of PrairieSoft, Inc. All other brand or product names are trademarks or registered trademarks of their respective holders.

Circle 269 on reader service card

PowerTable ergonomics. The other key to productivity.

Your Mac got up to speed. Did you? Using a more powerful computer means new tasks. That takes more time! Now comfort becomes a real issue.

Unlike most other computer tables in its price range, PowerTable's many features include an adjustable keyboard surface, which reduces fatigue. Call today for a free catalog.

PowerTable®

More quality for your money.

☎ 800-722-6263



ScanCo

P.O. Box 3217, Redmond, WA 98073-3217. (206) 487-2618

PowerTable design is patent pending. PowerTable is a trademark of Scandinavian Computer Furniture, Inc.

Macworld

HOW TO CONTACT MACWORLD

SUBSCRIPTION QUESTIONS

Mainland USA 800/288-6848
All other locations 303/447-9330
or write Subscription Services
P.O. Box 54529
Boulder, CO 80322-4529

MACWORLD ON AMERICA ONLINE

Macworld subscribers can contact *Macworld* editors online via the Macworld area on America Online. The area features reviews, news, new-product announcements, version information, a database of products, and *Macworld*-sponsored message boards and conferences. Several of our editors log on regularly. To obtain a free America Online software kit, call 800/227-6364, extension 5254.

MACWORLD IN MICROFORM

Macworld is available on microfilm and microfiche from UMI, 300 N. Zeeb Rd., Ann Arbor, MI 48106-1346; 313/761-4700.

BACK ISSUES OF MACWORLD

Write to Back Issues of *Macworld,* c/o Snyder Newell, Inc., P.O. Box 7046, San Francisco, CA 94120-9727; $6 per issue ($20 overseas). Prepayment in U.S. funds necessary. Make checks and money orders payable to Macworld Magazine.

MACWORLD EDITORIAL

MAIL OR COURIER Macworld Communications, Editorial Dept., 5th floor, 501 Second St., San Francisco, CA 94107; 415/243-0505.
AppleLink: Macworld1
CompuServe: 70370, 702 Fax: 415/442-0766

LETTERS TO THE EDITOR All written comments, questions, and suggestions regarding any aspect of the magazine are read by our editor. We reserve the right to edit all submissions; letters must include your name and address. Direct all correspondence (by mail or electronically) to Letters to the Editor.

QUESTIONS AND QUICK TIPS Direct questions or tips on how to use Mac computers, peripherals, or software (by mail or electronically) to Quick Tips, Lon Poole. Please include your name and address.

CONSUMER ADVOCATE Been burned? Really steamed? Direct your concerns (by mail or electronically) to Conspicuous Consumer, Deborah Branscum.

NEW PRODUCTS AND UPDATES Direct press releases and product announcements (by mail or electronically) and shrink-wrapped software upgrades (by mail or courier) to New Products Editor.

BUGS & TURKEYS Mail in descriptions of turkeys (flaws in conception or design) or bugs (defects or flaws in execution); copies of correspondence with vendor or telephone contact notes (if any); and your telephone number, mailing address, and T-shirt size.

STREETWISE SHOPPER To obtain an application for inclusion of special product promotions in *Streetwise Shopper,* vendors and resellers should contact Charles Barrett (by mail or electronically).

REPRINTS AND PHOTOCOPY PERMISSION Permission will be granted by the copyright owner for those registered with the Copyright Clearance Center (CCC) to photocopy any article herein—for personal or internal reference use *only*—for the flat fee of $1.50 per copy of the article or any part thereof. Specify ISSN 0741-8647 and send payment directly to the CCC at 27 Congress St., Salem, MA 01970. Address requests for reprint orders and for permission to copy editorial for other purposes to Reprints and Permissions, Editorial Dept.

WRITING FOR MACWORLD Do not send us unsolicited manuscripts. If you're interested in writing for *Macworld,* send a stamped, self-addressed envelope along with a request for our writer's guidelines. Direct (by mail) to Writer's Guidelines, Editorial Dept.

FOUNDER David Bunnell
FOUNDING EDITOR Andrew Fluegelman 1943–1985

Macworld is a publication of Macworld Communications, Inc. *Macworld* is an independent journal not affiliated with Apple Computer, Inc. *Macworld, Macworld Interactive, Macworld Shopper, MW, MW Lab, MW Shopper, Desktop Critic, Quick Tips,* and *Conspicuous Consumer* are registered trademarks of International Data Group, Inc. *Power PC World* and *Star Ratings* are trademarks of IDG, Inc. APPLE, the APPLE LOGO, MAC, and MACINTOSH are registered trademarks, and MACLETTER and POWERBOOK are trademarks of Apple Computer, Inc. Printed in the United States of America. Copyright © 1994 Macworld Communications, Inc. All rights reserved. *Macworld* is a member of IDG Communications, the world's largest publisher of computer-related information.

BPA INTERNATIONAL IDG

Introducing Joule™, a modular system so innovative it redefines mass storage.



LACIE
LIMITED
A QUANTUM COMPANY

The Joule™ Modular Storage System

only from La Cie, a Quantum Company

The Joule™ Modular Storage System

Joule System Components

Innovative technology at surprisingly affordable prices.



The Joule Top Cap



Joule 2.5" Hard Drive Module with Mount



Joule 3.5" Half-Height Module with Mount



Joule 3.5" Full-Height Module with Mount



The Joule Base

The Joule system and switchable active termination are patent pending.

Like building blocks, Joule tops one great drive with another—No tools required.

There's a reason Joule (pronounced "Jewel") doesn't look like other mass storage systems. It isn't. Joule is modular. Uniquely versatile. Unconventionally easy-to-use. And unexpectedly elegant.

Joule is a radical concept that transcends the boundaries of conventional drive engineering. It allows you to combine a variety of hard disk drive and removable media drive options into a single vertically interlocked system.

Joule's modular concept eliminates cumbersome redundancies in cables, power supplies and circuitry. It's unique tower design makes installation child's play and expanding or changing your system effortless and fast. It also allows you to move drive modules in and out of the system—at will—without affecting the system's operation.

Joule reinvents the "ins and outs" of portable mass storage.

Everyone knows the hardest part of moving portable hard drives from one computer to another is wrestling with the cables. Joule's drive modules are cable free. They mount and dismount from the system with single-handed ease. And, because removing modules doesn't affect the system's operation, there's no easier way to move mass storage—from workstation to workstation, across the office, across town or across the country.

Joule Base with 1080MB Hard Disk Installed, plus 105MB SyQuest Module and 270MB Hard Disk Module



340MB Joule Base

$389

Joule Base with 340MB Hard Disk Installed

Call for details on terms, conditions, limited money back guarantee (shipping not included), warranty and free offers. Comparisons may not apply to all vendor products, check specifications. ZFP+ Drives do not have switchable termination. Prices do not include shipping and only apply to products shipped within the continental United States. International customers must pay for all shipping charges. Add sales tax where applicable. Joule, ZFP, ZFP+, Tsunami, PocketDrive, PocketDock, Silverscanner, Silverscan, Silverlining, La Cie and the La Cie logo are trademarks of La Cie, Ltd., a Quantum Company. FORTUNE 500 is a registered trademark of the Time Inc. Magazine Company. All other trademarks are the property of their respective companies. All prices, specifications, terms, warranties, descriptions, products and services herein are subject to change without notice or recourse. © Copyright 1994 La Cie, Ltd. 8700 SW Creekside Place, Beaverton, OR 97005. Phone: (503) 520-9000, Fax: (503) 520-9100. All rights reserved Printed in U.S.A.

advantages are simply towering.

The ultimate in plug n' play versatility. Here's how it works.

The Joule Base combines a hard drive or removable drive mechanism with a universal 100 watt power supply and standard SCSI circuitry plus a unique list of performance and convenience features. It can operate alone or support up to seven mounts and drive modules. Each features La Cie's exclusive LaTerm™ digital active termination switch (patent pending), a SCSI port and ID switch, and two auxiliary power outlets for attaching other SCSI peripherals. The power switch, activity LED and termination status LED are conveniently located in the front.

Joule Mounts pass power and SCSI signals from the base through each interlocking mount (patent pending). Mounts also allow modules to be inserted or removed, leaving the SCSI chain intact.

Joule Drive Modules offer even greater selection. Hard disks from 170MB to 2050MB, plus a full range of SyQuest, optical, tape and DAT modules are available to complete your system.

The Joule Top Cap contains the SCSI cable to the Mac giving the system a clean single-cable design, regardless of the number of modules.

Building on a firm foundation.

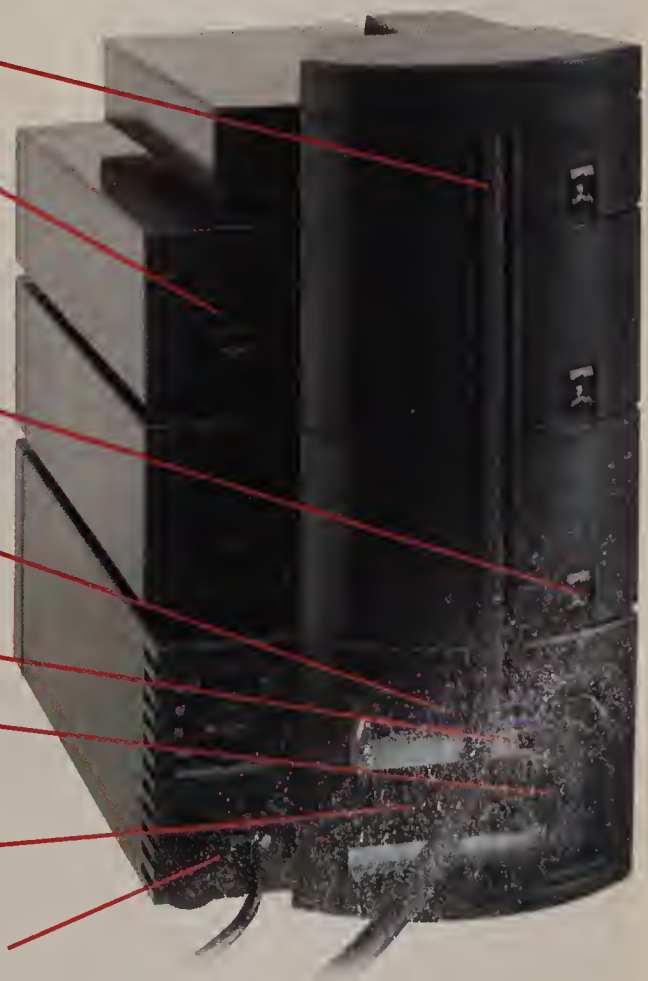
With Silverlining disk management software, Quantum quality, a great warranty and toll-free technical support, Joule offers every La Cie advantage. As a Quantum Company, La Cie is backed with a Fortune 500® commitment to quality and service.



Joule Base with 1080MB Hard Disk Installed, plus 2050MB Hard Disk Module, 2050MB Hard Disk Module (detached), 2050MB Hard Disk Module and 1080MB Hard Disk Module

OVER 8000MB TOTAL!

Joule System Rear View



LACIE LIMITED
A QUANTUM COMPANY

To order or for more information, call toll-free

800-999-1457

Mon.-Fri. 5 a.m.-7 p.m. & Sat. 8a.m. -noon PST

International 503-520-9000 Fax 503-520-9100 (24 hrs.)
UK 0800-89-3025 Australia 0014-800-123-007

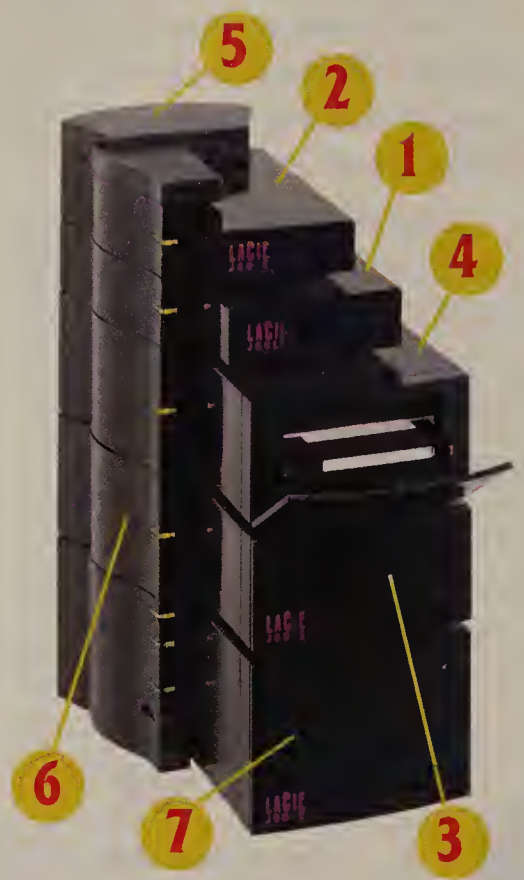
VISA, MasterCard, C.O.D. and approved purchase orders accepted.*

Everything about Joule™ is

Joule System Components

Joule interlocking storage system.

The Joule Modular Storage System is the most versatile and convenient mass storage solution available (patent pending). Select from a full range of hard disk and removable media options in base and module units.



1 Quantum 3.5" Drives

Capacity	Base w/ TopCap	Module w/Mount
170MB		$259
270MB		$329
340MB	$389	$359
540MB	$639	$609
1080MB	$949	$919
3 1800MB		$1259

2 Quantum 2.5" Drives

Capacity	Module w/Mount
85MB	$299
160MB	$349
256MB	$449

3 Seagate Drives

Capacity	Module w/Mount
1650MB	$2039
2050MB	$2329

4 Removable Drives

Drive	Base w/ TopCap	Module w/Mount
SyQuest		
105MB	$539	$509
270MB	$689	$659
DAT		
5.0GB DAT	HOT!	$1159
TurboDAT		$1629
8.0GB DAT		$1729
Tape		
155MB		$569
600MB		$789
Optical		
128MB		$1179

Additional Accessories

5	Top Cap	$49
6	Mount	$69
7	Joule Base (no drive)	$199

The La Cie Advantage

MW Editors' Choice ★★★★★ Bobker's Dozen ID Awards

- Silverlining™ Disk Management Software
- Unlimited TOLL-FREE Technical Support
- 30 Day Money Back Guarantee
- All Drives Burned In and Tested
- Ready to Plug and Play
- Valuable Warranties
- LaTerm™ Digital Active Termination
- Double Shielded SCSI Cables
- FCC*, UL, TUV, VDE & CSA Approved
- Termination Status LED
- Surge Protection
- Front Power Switch

*Call for details on terms, conditions, limited money back guarantee (shipping not included), warranty and free offers. Comparisons may not apply to all vendor products, check specifications. ZFP+ Drives do not have switchable termination. Prices do not include shipping and only apply to products shipped within the continental United States. International customers must pay for all shipping charges. Add sales tax where applicable. Joule, ZFP, ZFP+, Tsunami, PocketDrive, PocketDock, Silverscanner, Silverscan, Silverlining, La Cie and the La Cie logo are trademarks of La Cie, Ltd., a Quantum Company. FORTUNE 500 is a registered trademark of the Time Inc. Magazine Company. All other trademarks are the property of their respective companies. All prices, specifications, terms, warranties, descriptions, products and services herein are subject to change without notice or recourse. FCC grant pending on Joule. © Copyright 1994 La Cie, Ltd. 8700 SW Creekside Place, Beaverton, OR 97005. Phone: (503) 520-9000, Fax: (503) 520-9100. All rights reserved. Printed in U.S.A.

remarkable...even the price.

La Cie Storage Solutions



Tsunami™: Sleek, transportable.

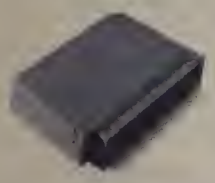
Our award-winning Tsunami drives offer superb performance and design.

Quantum 3.5" Drives

Capacity	Internal	Tsunami
170MB	$199	$259
270MB	$269	$329
340MB	$299	$359
540MB	$549	$609
700MB		$699
1080MB	$859	$919
1650MB S	$1979	$2039
1800MB	$1199	$1259
2000MB S	$1919	$1979
2050MB S	$2269	$2329

S=Seagate mechanism

PocketDrive™: Palm-sized portability.



Weighing in just under 10 ounces, the only pocket portable to offer the PocketDock™ docking option.

Quantum 2.5" Drives

Capacity	Internal PowerBook*	PocketDrive
40MB		$239
85MB	$199	$299
160MB	$249	$349
170MB	$259	$359
256MB	$349	$449

*LaserWriter 630 installation kit available

Removable media: Limitless storage options.

For the finest in removable media mass storage solutions, La Cie offers an outstanding selection of drive technologies in our zero-footprint case. Silverlining (or Retrospect® with tape and DAT drives) plus one free media cartridge included.

ZFP Removable Drives

Drive	Internal	External
SyQuest		
44MB	$369	$429
88C MB	$479	$539
105MB	$449	$509

Cartridges	44MB	88MB	105MB
	$69	$99	$79

Each drive comes with Silverlining™ and one free SyQuest cartridge.

CD-ROM

Toshiba Dual Speed	$639	

Optical Drives

128MB	$1109	$1179
128MB Cartridge		$45

Each drive comes with Silverlining™ and one free 3.5" optical cartridge.

DAT

HOT! 5.0GB DAT	$1099	$1159
TurboDAT	$1569	$1629

Tape

155MB		$569
600MB	$729	$789

Each drive comes with Retrospect™ and one free DAT or TEAC tape cartridge.

Color Scanning Solutions



Silverscan II makes scanning as quick, painless and productive as possible. With features like dynamic color preview (16 sec.), magnify in preview, proof in preview, savable scan settings, up to 400% scaling in 1% steps and up to 1600 dpi in 1 dpi steps—all in one pass. It's easy for the beginner and powerful for the advanced user. And it's Macworld's Editor's Choice.

"...Fast and a pleasure to use. ...Produced high-quality printed images with good resolution, and its documentation was tops."
Macworld, November 1993

Silverscanner II

All Silverscanners come with our powerful Silverscan software, Color It! image editing software and Read-It O.C.R. Pro.

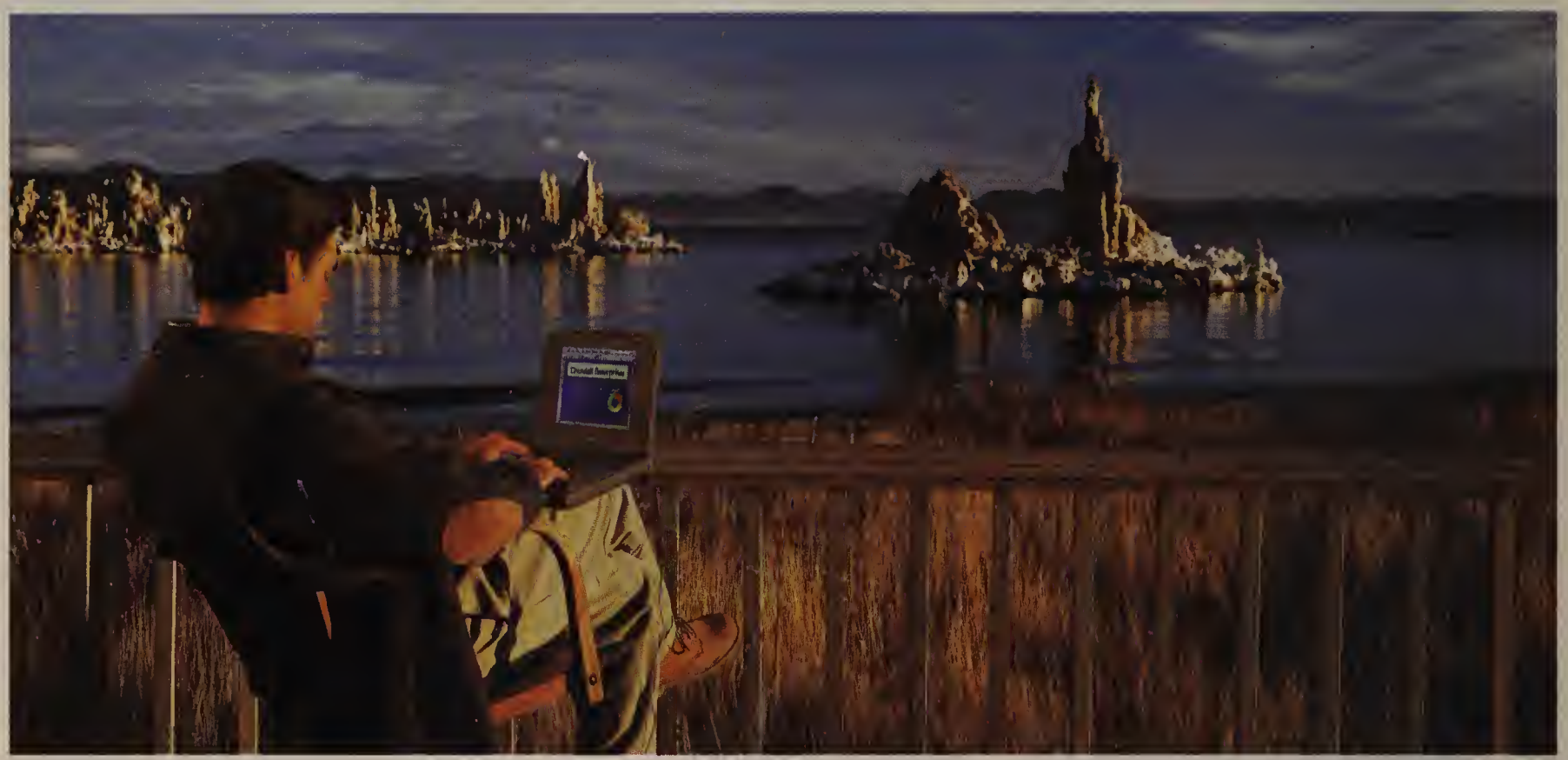
Basic Bundle	$1599
Basic Bundle Plus Cachet	$1899
Bundle Plus Cachet & ColorStudio	$1999
Bundle Plus Photoshop	$1999
Optional Transparency Attachment HOT!	$799
Optional Sheet Feeder Attachment HOT!	$499

LACIE LIMITED
A QUANTUM COMPANY

To order or for more information, call toll-free
800-999-1457
Mon.-Fri. 5 a.m.-7 p.m. & Sat. 8a.m. -noon PST
International 503-520-9000 Fax 503-520-9100 (24 hrs.)
UK 0800-89-3025 Australia 0014-800-123-007
VISA, MasterCard, C.O.D. and approved purchase orders accepted.*

Circle 52 on reader service card

Now you can access your office from anywhere you happen to be. Bummer.



Under normal circumstances, the last thing you want to think about when you're away from the office is the office. Then again, when was the last time you operated under normal circumstances?

What you really want is the power to control the way you work. To turn wherever you are at the moment into the most productive place on earth. Unrestricted by walls, time sheets and bad coffee.

What you really want, in other words, is freedom. The freedom that comes with the Apple® Remote Access family of Client, Personal Server and Multiport Server products.

With Apple Remote Access, Macintosh® and PowerBook® users can easily dial into office computers, servers and networks from virtually anywhere they happen to be. Anytime they happen to be there.

Once connected, it's just like being in the office. You can retrieve files. Collaborate with colleagues. Send and receive electronic mail. Or even print documents. All from the most remote locations.

Apple Remote Access works with System 7. Which means you work with tools you're already familiar with, such as the Chooser and Finder. And with integrated DialAssist,™ you can dial in from just about any place on the planet without having to hassle with outside lines, country codes or credit card numbers.



The Apple Remote Access *family of Client, Personal Server and Multiport Server products gives you the flexibility to work wherever you want, yet still have access to all your office resources.*

No matter how big your organization is, there's an Apple Remote Access solution designed for you. Call 800-538-9696, extension 150, for the Apple reseller in your area. Wherever that may be.

In Canada, call 800-665-2775, ext. 910. ©1994 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, Macintosh and PowerBook are registered trademarks of Apple Computer, Inc. DialAssist is a trademark of Apple Computer, Inc. This ad was created using Macintosh personal computers.



BY ADRIAN MELLO

Once and Future Classic

The Mac's original design is no more. How to resurrect it?

SOMETIME IN EARLY WINTER, the Color Classic vanished from the U.S. market. Just as it was discontinued in the United States, a faster version called the Color Classic II was introduced in Japan (and is still available there). While everyone was distracted by the pyrotechnics of the Power Macintosh introduction, the ancestor of all Macs faded from view. Along with the Mac's system software, the Classic's charismatic design represented the essence of the Macintosh computing experience.

After the Power Macintosh intros in mid-March, it dawned on me that Apple no longer sells anything that looks like the original Mac. I felt a strange sense of loss. Why was the Color Classic killed? Why didn't it succeed? How could Apple create a new Classic that could recapture buyers' interest and the Macintosh community's loyal admiration?

The Fall of the Classic

There's nothing mysterious about the Classic's demise, according to the Apple people I talked to. Apple's customers prefer other Macs. Despite being somewhat more expensive, the big all-in-one models such as the Performa 550 and LC 520 are very successful due to their larger screens and built-in CD-ROM drives. Economy-minded buyers can get an entire LC III system with a (larger) 14-inch monitor for under $1000—around the best price for a Color Classic. The Classic also couldn't accommodate a number of standard components that buyers want in a low-cost personal computer. Buyers expect color, and the education and home markets want CD-ROM drives. Because of lower production volumes, the Color Classic's 9-inch monitor costs as much as or more than the 14-inch monitors sold with most computers. A standard CD-ROM drive wouldn't fit into the Classic's case. The Classic had become an expensive novelty that didn't offer as much value to buyers as other, feature-laden (if more prosaic-looking) Mac models.

I'm not doubting the wisdom of Mac buyers, or Apple's understanding of its customers. Most of the Classic's practical virtues live on in other Mac models, but through pragmatism we lost the emblematic cabinet design and something else—personality, character, and tradition.

The Lost Icon

The Classic had a personality. Every other desktop computer is a faceless clone. Put the Classic in a room with other desktop PCs and it looks alive, while all the other boxes sit like dull automatons. The Classic's physical demeanor meshed perfectly with the Mac's mission. The original Macintosh wasn't trying to be another muscle-bound three-box computer. It was the most human of computers, relying on intelligence and approachability instead of brute strength. The compact



and upright stance of the Classic demonstrated courage, affability, and individuality—all aspects of the Macintosh design philosophy. Basically, the Classic looked like a higher life-form, like E.T.

The soul of the Mac lives on in its friendly operating system, but its favorite vessel has passed on. In most ways, Macs have improved. Apple still has the best industrial design in the business, but in becoming as practical and affordable as PCs, the Mac family has unfortunately started to look like PCs.

One of the outstanding virtues of the original Mac was its plug-and-play capability. Nearly ten years after the original Mac came out, Compaq has begun trumpeting the virtues of this simple-but-brilliant design philosophy. And the company promises to deliver it real soon now, just as soon as Microsoft delivers the Chicago version of Windows, which is delayed—again. Similar to the other ways PCs have imitated the Macintosh, this version of plug and play will probably be a kludgey add-on for some PCs, and nothing like the ground-up integration built into every Mac.

Of course, plug and play lives on in all current Macs, but the most committed plug-and-play models come as a single box, like the original Mac. This eliminates cables between the monitor and the system box, and makes it unnecessary for users to learn about and choose between monitors because the display is integrated into the cabinet.

There are still all-in-one Macs, including the LC 575, LC 520, and Performa 520. These highly successful machines are like the Classic on steroids. But they have no character, and they don't evoke the response that a Classic Mac did. Because their designers contoured the cases to look as if the monitor could be separated, these computers seem obsequious or unsure of themselves. Apple should redesign these one-box systems to have personality.

Remaking of a Classic

It is clear that for the Classic to rise again, Apple would have to reinvent it. The Color Classic was an attempt at reinventing the Classic. It looked different from the Classic and had more functionality. Not everyone liked its looks, but it did have character. Unfortunately, it was too slow and too expensive. A pizza-box

continues

GLEN MITSUI/STUDIO MD

model such as the LC III costs just a bit more with a bigger screen and a lot more speed. But the Color Classic's biggest problem was that it had no clear mission, distinct from other Macintosh models. So how can Apple revitalize the Classic so that it resonates with the personality and tradition of the original design?

- A new Classic should be small, with a keyboard not much wider than the system. There's still a need for a small-footprint desktop computer.
- A new Classic should be fast. A small upright computer should feel swift and nimble, not ponderous. A speedy Classic could use the 68LC040 chip found in the Quadra 605.
- A new Classic should have the expandability of the Color Classic, which offered a pullout expansion drawer. Despite the engineering difficulty, Apple should add a CD-ROM drive, and create a great inexpensive player for titles.
- A new Classic should have a strong visual identity. It should assert its individuality and stand upright instead of assuming the prone position of a PC. Apple should make it black and slick.

A New Mission

But more important, give the next Classic a new mission. Its smaller size would make it ideal for personal communications. The next Classic could combine a desktop computer and communications center, saving desk space and money. An office phone has nearly two-thirds the footprint of the original Mac. The new Classic could have an option for a built-in phone. Perhaps a videoconferencing option would be appealing in a hybrid communications/computing system that combines voice mail, E-mail, and other communications. The new Classic would also be good for word processing, contact management, and other mainstay productivity tasks.

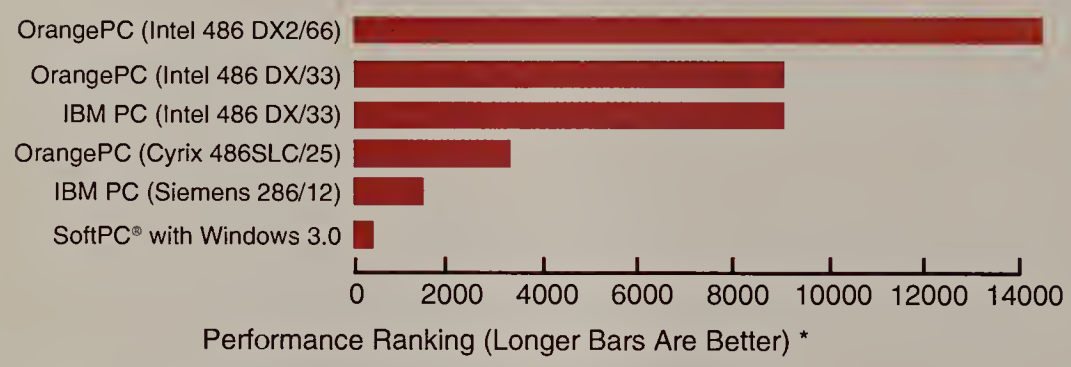
A version of the Classic could have an integrated docking station for a Newton, another PDA, or a palmtop. I think most people have a greater need for a fully integrated approach like this than for a standalone PDA. People should be able to take notes and manage their activities with maximum portability, and then seamlessly integrate data with the new Classic.

There you have it. Frankly, I'm not expecting Apple to make a new Classic. Fans of the original compact Mac design should probably form a club and find ways to breathe new life into our old machines. I've heard that it's technically possible to install a Performa 550 or LC 520 motherboard in a Color Classic if someone could write a simple enabler. And somewhere in my garage there's a can of spray paint labeled Batmobile Black.

It would be hard for Apple to make a successful new Classic. All the same cost issues apply that led to the Classic's demise in the first place. It would take a tremendous act of will on Apple's part to reinvent the Classic, and it would be a brave gamble. It couldn't be the least expensive Mac, and this runs against the lessons learned over the last few years.

Pragmatism is at least as important as innovation at today's Apple. But pragmatism alone won't ensure the long-term success of the Mac. The Power Macintosh promises to eventually provide an astonishing new interface with innovative applications. But we need a model that preserves the tradition of the Macintosh way. To maintain our strength and hope against the mindless robotic hordes of PCs and their championship of mediocrity, we need an emblem to rally around. We need a new Classic to remind us that the Mac has always been insanely great. m

How fast is Windows™ on a Macintosh® ?



It's blazingly fast with our newest version of OrangePC. Incorporating an Intel®486 DX2/66, the OrangePC NuBus card is a state-of-the-art solution for running your MS-DOS®/Windows based applications inside a Macintosh window. Unlike lumbering DOS software based emulators, OrangePC packs the power and the features to get the job done for serious power users. OrangePC combines dramatic 486 DX2/66 performance with a 128K cache, 64 megabytes of on-board memory, SuperVGA graphics, and PCMCIA for all your expansion needs. Also, the OrangePC offers high-speed, seamless, network connectivity. It's like having a complete IBM® PC inside your Mac which can run Windows applications simultaneously and independently of your Mac's 680X0 or PowerPC™ programs.

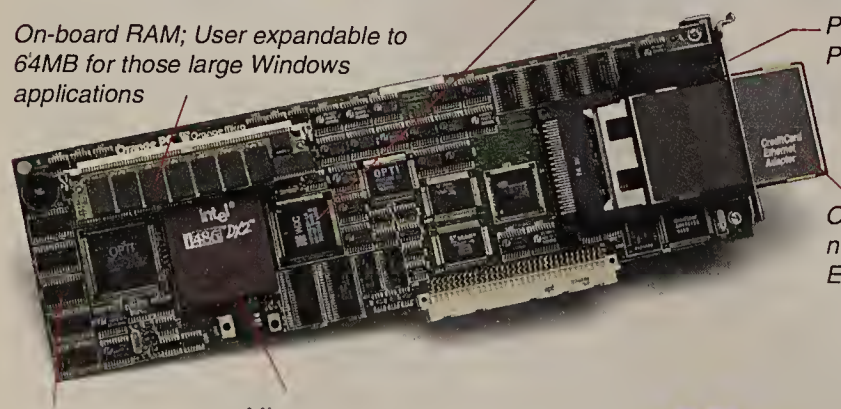
So if you want the fastest Windows performance for your Macintosh or PowerPC Mac, call us now for your own OrangePC. Priced from $999.00.

OrangePC® MS-DOS Coprocessor

SuperVGA compatible graphics; Supports 1024x768 with 265 colors

On-board RAM; User expandable to 64MB for those large Windows applications

PC compatible Serial and Parallel ports



Optional PCMCIA card for network compatibility: Ethernet, Token Ring, etc.

128K cache boosts the 486 performance

Microprocessors up to Intel 486 DX2/66

MacUser June/93

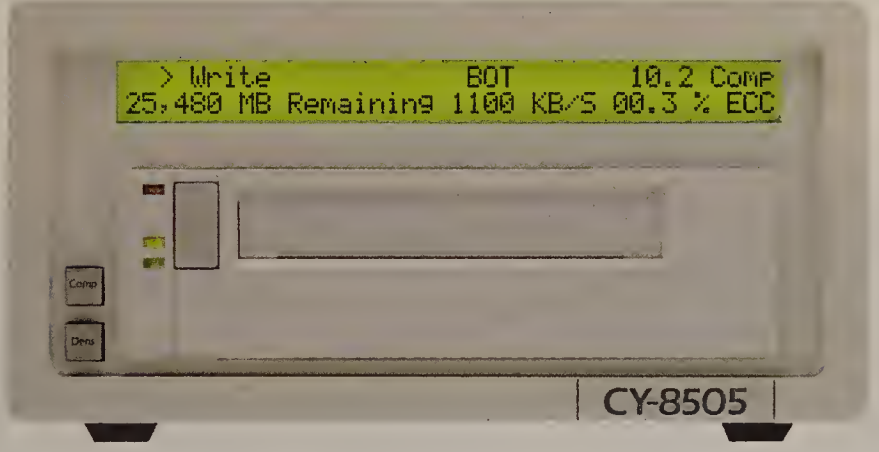
yes it runs with NetWare

Orange Micro® Inc.
"14 Years of Innovation and Excellence"
1400 N. Lakeview Ave., Anaheim, CA 92807
(714) 779-2772

* Benchmark results are based on the Processor Harmonic measurements from PC Bench version 7.01 SoftPC for Windows wes run on a Quadra 700.
© 1994 Orenge Micro, Inc

Circle 33 on reader service card

OUR 25 GB TAPE DRIVE JUST HIT A NEW HEIGHT.



It's smaller; yet our new CY-8505 backs up the largest Macintosh computer systems and networks, unattended.

How? Optional data compression boosts the 5 GB capacity to up to 25 GB. And it's fast – able to write data at speeds of up to 90 MB per minute. Such high performance means huge savings in manhours and media costs. Best of all, the MTBF rate of 80,000 hours gives you data reliability you can depend on.

The CY-8505 features software that lets you schedule full or incremental backups to run any time, day or night. A directory of files is stored on the disk, making it fast and easy to restore. A backlit status display gives you command under execution, compression ratio, transfer rate, tape remaining and more in a clear, easy to read format.

In short, you won't find a more advanced, more reliable solution on the market.

What's more, we back this turnkey solution with a two year warranty that includes responsive service and support from our in-house staff.

TRUE COMPATIBILITY WITH

Alliant	AT&T	DEC	ICL	Novell	Prime	Texas Instruments
Alpha Micro	Basic-4	Gould/Encore	Intergraph	OS/2	Pyramid	Unisys
Altos	Concurrent	HP	Macintosh	PS/2	Sequent	Ultimate
Apollo	Convergent	IBM	McDonnell Douglas	Parallel Port	Silicon Graphics	Wang
Arix	DataGeneral	IBM PC	Motorola	Pertec	STC	*—and more*
			NCR	PICK	Stratus	
			NeXT	Plexus	Sun	

For more information, call today at **(804) 873-9000.**

CONTEMPORARY
CYBERNETICS

Rock Landing Corporate Center • 11846 Rock Landing • Newport News, VA 23606 • Fax (804) 873-8836

Circle 188 on reader service card

Semi-pro.



HP ScanJet II CX

If you're a sophisticated scanner user, you shouldn't have to settle for a semi-sophisticated scanner. Not when the 1600 dpi EPSON 800C Pro/Mac has so much more to offer. More versatile controls. More powerful software. Better connections. Stronger support. More flexible options. All of which makes this the one scanner that will actually live up to your

*One-year warranty, extendable to two years with return of registration card, at no charge. EPSON, HP, Macintosh, Adobe Photoshop, and Kai's Power Tools are trademarks or registered trademarks of Seiko EPSON, Corp.; Hewlett Packard Co., Apple Computer, Inc., Adobe Systems and HSC Software respectively. All other trademarks are the property of their owners. ©1993 EPSON America, Inc., 20770 Madrona Ave., Torrance, CA 90503. For dealer referral or warranty details, call **800-BUY-EPSON** (800-289-3776). In Canada, call (**800**) **GO-EPSON**. For Latin America, **305-265-0092**.

Pro.

The 800C Pro/Mac is solidly backed by EPSON's one-year warranty extendable to two years. HP's warranty is one year.*

The 800C Pro/Mac comes with both SCSI and bidirectional parallel interfaces so you can connect it to a PC and a Mac simultaneously. The ScanJet II CX connects to one computer.

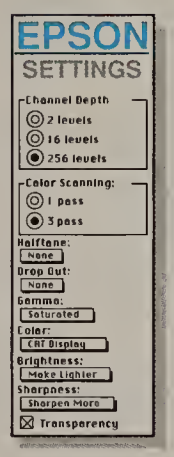


EPSON's transparency unit and document feeder are powerful options that work across every scanner in our line. HP's scanner options aren't that flexible.

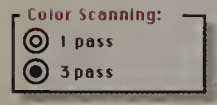


The 800C Pro/Mac package includes the powerful full version of Adobe PhotoShop, plus the highly acclaimed Kai's Power Tools. HP offers a limited version of PhotoShop.





Only EPSON has color and gamma correction settings built right into the scanner hardware.



The 800C Pro/Mac gives you the flexibility of 1- or 3-pass scanning for optimal results with any image. The ScanJet II CX is strictly a 1-pass scanner.

THE EPSON CONNECTION

If you need technical assistance, you can call the pros at the EPSON Connection, our toll-free help line.



EPSON 800C PRO
FOR MAC

exacting professional standards. For our free booklet on scanning, or more information on the 800C Pro/Mac or our other scanners for Macintosh and PCs, call the EPSON Connection at **1-800-BUY-EPSON** (800-289-3776). And get the scanner that's in a league of its own.

EPSON®

INTRODUCING Pixar Typestry 2



Have Particles flying out of your letters...you animate them too!



Use Tubes and create your own Looks for neon effects.



Use Rubber Sheets and make waving flags and bouncing balls.

Pixar
1001 West Cutting Blvd.
Richmond, CA 94804
(510) 236-4000
(510) 236-0388 Fax

"Pixar has outdone themselves with the new special effects in Typestry 2... Cool new features include Particle effects, Tubes and Rubber Sheets...

Many of the new capabilities make it suitable for multimedia professionals but can easily be used in print.

With these high-end features, Typestry 2.0 could be the titling tool of choice at just $299."

Sean Safreed
— MacUser

Pixar Typestry 2 transforms Type 1 or TrueType fonts and your Adobe Illustrator files. Scale them, twist them, stretch them, warp them. Even make a little movie with them.

Pixar Typestry 2.0 – more power, more design options, more amazing effects. Makes images that sparkle, sizzle and glow. Make your own perforations and make custom versions of your Looks. Simple as 2D, stunning as 3D.

You loved Typestry 1 — you're not going to believe Typestry 2!

1 (800) 888-9856



P · I · X · A · R

Circle 13 on reader service card

Don't miss these other great Pixar graphic products:

SHOW PLACE
MACRENDERMAN

Pixar Showplace with MacRenderMan
Wonderful scene composition software for creating 3D pictures without modeling. Has over 130 pre-designed objects, powerful plug-ins, Adobe Illustrator, DXF and RIB support, impressive Looks and Glimpse, the amazing Looks editor. The perfect next step for Pixar Typestry users.

PIXAR
One Twenty Eight

Pixar One Twenty Eight CD
Classy collection of seamlessly tiling digital photographs. Exquisite quality TIFF images, easy-to-use Photoshop/PhotoStyler plug-ins. Perfect for backgrounds or composites in 2D design or as texture maps for 3D. Makes great Looks for Typestry and Showplace.

Letters

Drawing the Wrong Conclusions

I'LL BET DEKE McCLELLAND'S REVIEW of Aldus FreeHand 4.0 (*Macworld*, March 1994) would not be as favorable if it were not for his extensive experience with Adobe Illustrator. Perhaps, compared with Illustrator, FreeHand 4.0 is a step in the right direction. But compared with FreeHand 3.1, it is a step backward. Being a longtime devotee of FreeHand (since 1988), I can assure you that version 4.0 does the same thing as your vacuum cleaner, and I don't mean that it cleans up.

With release of this upgrade, I fear that Aldus has lost the grip it once held in the drawing program market, *drawing* being the operative word here. Over half of Mr. McClelland's review of a drawing program was devoted to its text-handling features. What's wrong with this picture? We do not need slow and often impossible-to-edit tables in a drawing package, nor do we need a poorly designed text ruler. Leave the text to Aldus PageMaker—FreeHand is supposed to be an illustration tool.

FreeHand 4.0 is cluttered with palettes (Deke claims nine, but there are actually ten); even the old masters could handle only one palette at a time. In all, these palettes occupy nearly 35 square inches of screen real estate. What was the program-development team at Aldus thinking? What was wrong with the dialog boxes you brought into view with a keystroke, edited quickly, and closed by touching the enter key? They helped make the software work like a taboret, a common piece of art-studio furniture that holds graphics tools so that only the drawing occupies the drawing board. The artist pulls tools from the taboret without interrupting the work in progress.

The system requirements listed on the FreeHand 4.0 package should read "68040 (or plenty of free time), a minimum 20-inch monitor (to accommodate palette clutter), and a burning desire to become a word processor instead of an illustrator." One more request: Aldus, if you're listening, please don't fix these problems by releasing another version and renaming it "Professional."

Bill Jennings
Placentia, California

In truth, FreeHand 4.0 has 11 palettes—we found another after we read Mr. Jennings's letter. We hope the palettes aren't breeding.—Eds.



WARD SCHUMAKER

Vendors Don't Deserve Sympathy

PLEASE—SPARE US THE MANUFACturers' bellyaching about the cost of tech support (*Conspicuous Consumer*, March 1994). Manufacturers' costs are nothing compared with what we users put up with from bug-ridden products and poor instructions. More than half of my tech-support calls are due to inadequate or downright wrong instructions, and 99 percent of the rest result from product bugs. Maybe some bugs are excusable, but poor instructions are not, especially when a company refuses to correct known errors printed in its manuals.

Consider the instruction/reference card for my Hewlett-Packard LaserJet IV printer. I could not solve a persistent (and expensive) stoppage problem by following the instructions. When I called HP tech support, I learned (after 20 minutes on long-distance hold) that the *instructions* were in error, and that HP had known about the errors for more than a year but didn't deem it enough of an issue to bother correcting it.

Joel Amkraut
Los Angeles, California

According to Hewlett-Packard, the Quick Response Card that Mr. Amkraut refers to is intended to provide short-term help with common problems encountered by HP LaserJet users. The information on the card is incomplete, but the correct information can be found in the LaserJet owner's manual.—Ed.

Freeware ≠ Public Domain

I'M A LONGTIME SUBSCRIBER TO *Macworld* and am tickled to death, in one sense, to see myself mentioned in Erfert Fenton's article on fonts in the March 1994 issue ("The Right Font"). But I'm also good 'n' mad, too, because she got much of it wrong.

On page 119 of the issue, my Logger font is featured in "Specialty and Miscellaneous Faces" as example 8, with the identification "Logger, a public-domain font by David Rakowski." I never released a font into the public domain; to do so would mean I relinquish any copyright. I released that font as freeware while retaining the copyright, which is vastly different from Ms. Fenton's characterization of Logger as in the "public domain."

The second, even more glaring, error regards Ms. Fenton's description of Lazy Dog Foundry's Cheese Dog and Running Dog collections, which she calls "the cream of the crop from shareware and public-domain font archives." Wrong again. All of the fonts in those collections

continues

A Sure Cure For The PowerBook™ Battery Blues...

VST ThinPack™ and ThinPack PLUS™ are high-density, maintenance-free batteries for the PowerBook™ 100 through 180c. Both are UL listed for safety and come bundled with VST Utilities battery management software.

ThinPack - 5 Amp-Hours
- Dimensions: 5" x 9" x 1/4"
- Weight: Only 1.5 lbs.
- Runtimes: 5-9 hours (b&w)
  3-4 hours (color)

ThinPack PLUS - 10 Amp-Hours
(Great for 165c and 180c users!)
- Dimensions: 11" x 9" x 1/4"
- Weight: Only 3 lbs.
- Runtimes: 8-15 hours (b&w)
  4-7 hours (color)

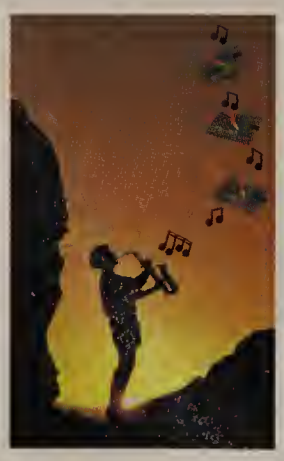
"VST's compact design and bundled software make it superior." - Macworld Mar '94

Distributed by:

INGRAM MICRO MERISEL

Available through all major resellers or at:

VST Power Systems, Inc.
Phone: (508) 287-4600
Fax: (508) 287-4068



MACWEEK

MACWORLD MW

MacUser Dec. 93

ThinPack™ is a trademark of VST Power Systems, Inc.
PowerBook™ is a trademark of Apple Computer, Inc.

Circle 73 on reader service card

CORRECTIONS

- *In the April 1994* Desktop Critic, *PCPC's number should have been 813/530-0123. The toll-free number is 800/622-2888.*
- *Also in April, Diagsoft's toll-free number in the "Troubleshooting Tips and Tools" feature should have been listed as 800/342-4763.*
- *In Step 6 of* Expert Graphics *(April 1994), the artist moved the Input (not the Output) Levels' white triangle to the Levels histogram's rightmost peak.*
- *In April's "Corrections," we should have said that Blyth Software is not yet shipping the Unix version of Omnis.*
- *In the February 1994 review of the NuTek Duet Mac work-alike, the "What Works—And What Doesn't" sidebar incorrectly implied that the Duet cannot work with network cards. In fact, the NuTek cannot work on an AppleTalk network, except for printing. Also, NuTek has tested compatibility with Apple's 8•24 Display Card.*
- *In the May 1994 feature "Power Mac Software," we listed the incorrect Core-Performance Index rating for the prototype 66MHz 486DX2-based Orange Micro OrangePC 290 coprocessor card. Its rating should be 18.4, putting it halfway between a 33MHz 486DX-based PC and a 66MHz 486DX2-based PC compatible.*

are licensed from me; none were ever released into the public domain, and none of the fonts in the collection that were originally released as shareware are sold in the same version—they have been cleaned up, international characters have been added, and hinting and kerning has been enhanced in every single font in those collections. Also, less than one-third of the fonts in the Running Dog and Cheese Dog collections were ever shareware fonts; the other two-thirds, for which Lazy Dog is the exclusive American proprietor, have been created since I stopped releasing shareware fonts.

David C. Rakowski
via CompuServe

I stand corrected. The Read Me file that accompanies the Logger font includes a copyright notice, making it freeware. Also, I did not mean to imply that Lazy Dog Foundry was engaged in unethical practices by distributing shareware or public-domain fonts in its Cheese Dog and Running Dog packages. In my experience, Lazy Dog has always been a reputable outfit. I reviewed Lazy Dog's Type of the Twenties & Thirties series and listed the other collections as additional offerings from the company; I didn't realize that the onetime-shareware fonts that made up a portion of the Cheese Dog and Running Dog collections had been enhanced since their initial release.—Erfert Fenton

Booster Booster

BASED ON YOUR ARTICLE IN THE March 1994 issue ("CPU Boosters"), I mailed my IIsi to Mac Experts in Santa Monica, California, on a Thursday and got it back the next Tuesday. I asked the company to do the boost ($89) and to fix the IIsi's sound problem ($25). I sent the CPU via overnight mail for $40 and paid another $40 to have it returned overnight, for a total of $194 portal-to-portal.

The clunky ol' IIsi that I love so much now has a new lease on life. It isn't an 840AV (my dream machine), but it did not cost me 4000 bucks, either. My new machine will last me another year or two until I mortgage the house for a PowerPC. Now if I can just figure out how to slam a cache card into that overcrowded little IIsi box.

Rohn Butterfield
via America Online

Fab Four Make Fab Disc

IN HIS REVIEW OF THE TOP-TEN CD-ROMs in the March issue, James A. Martin lists the Beatles' film A Hard Day's Night (The Voyager Company) as one of the worst CD-ROMs that he tested.

The author admitted that A Hard Day's Night was "actually a decent product." The only flaw he could put forth was that the film "doesn't deserve such veneration" as would a movie such as *Casablanca*. In my opinion, *A Hard Day's Night* does deserve such veneration, since it is an important piece of the history of rock and roll. But my opinion of the importance of the film is beside the point, as is Mr. Martin's.

A Hard Day's Night is a great example of what CD-ROM technology can deliver when developers take the time to do it right. In addition to the 1964 full-length feature film, there is also the film's script (which plays along with the movie); the trailer from the 1982 rerelease; an interview with the film's director, Richard Lester; and another short film by Lester that served as inspiration for *A Hard Day's Night*.

It would have been a much greater service to readers if Mr. Martin had warned them about CD-ROM titles out there with serious flaws in design and execution, instead of reciting his opinions

continues

Bye Bye Bernoulli.™
See Ya SyQuest.®
Hello Pinnacle!

NEW 230MB

3.5" Magneto Optical Drive

230 Megabyte

3600 RPM



Some technologies come and go. . . but optical is here to stay.
Say hello to Pinnacle's new Tahoe™ 230 Portable 3.5" Optical Hard Drive.

The Tahoe™ provides ISO interchangeability and removable storage with multiple media sources, while Bernoulli™ and SyQuest® offer no standards support.

PINNACLE OPTICAL VS. MAGNETIC REMOVABLE				
COMPANY	2.5GB	3.0GB	3.5GB	4.0 GB
Pinnacle Tahoe™ 230	$1499 w/ 4.3 disks	$1649 w/ 6.5 disks	$1799 w/8.7 disks	$1949 w/10.9 disks
Iomega® Bernoulli™150	$1492 w/ 6.7 disks	$1889 w/ 10 disks	$2286 w/13.3 disks	$2682 w/16.7 disks

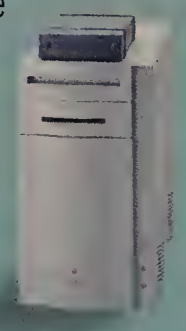
*Prices acquired directly from system integrator and/or manufacturer on 2/22/94. Formula: Final capacity divided by cartridge capacity multiplied by cartridge price and added to drive price.

PINNACLE OPTICAL VS. MAGNETIC REMOVABLE			
COMPANY	2.0GB	2.5GB	3.0GB
Pinnacle Tahoe™ 230	$1599 w/ 8.7 disks	$1749 w/ 10.9 disks	$1899 w/13 disks
MicraNet SyQuest® 270	$1763 w/ 7.4 disks	$2039 w/ 9.3 disks	$2315 w/11.1 disks
PLI SyQuest® 270	$1588 w/ 7.4 disks	$1810 w/ 9.3 disks	$2032 w/11.1 disks

And there's no doubt that over time optical storage costs *less* than magnetic storage.



It's a perfect solution for both portable and desktop computing.



PORTABLE **DESKTOP**

Thousands of graphic designers, pre-press facilities, multimedia creators and personal computer users are making the change to optical storage. So say hello to optical – and see ya later to magnetic technology.

Optical Drive
$999.00
Travel Case
& Battery Pack
$199.00
Optical Media
$69.00

For more information or to order call:

800.553.7070

PINNACLE MICRO

THE OPTICAL STORAGE COMPANY®

19 TECHNOLOGY • IRVINE, CA 92718, USA • (800) 553-7070 • INT'L (714) 727-3300 • FAX (714) 727-1913

Trademarks: Tahoe 230 of Pinnacle Micro, Inc. All trademarks and registered marks to their respective owners.

Circle 178 on reader service card



In fact, we'll do it for you. Introducing Open Sesame!, the world's first intelligent software assistant for the Macintosh. Open Sesame! observes how you work, *learns* your repetitive patterns, and then offers to do them for you. Automatically.

With a single click, Open Sesame! will open and close related sets of folders, documents and applications, create and manage multiple Apple Menu and Desktop items folders, and perform routine maintenance, like rebuilding your desktop...automatically. So you can do more with fewer clicks.

For example, suppose that every time you start up your Macintosh you immediately open your mail program. Open Sesame! will observe this and offer to do it for you. It will even find more efficient ways for you to use System 7.0, like making aliases and stationery automatically.

Here's what the critics say: "One that knocks my socks off is called Open Sesame! ...the simple fact is that Open Sesame! works smarter for me. It might just herald a new wave in mac smartware. ...The more you use it the better it gets." The Mac Manager, *MacWEEK*

"Macintosh users who like the flexibility of System 7 but tire of "tweaking" their desktop and Apple menu items will appreciate Charles River Analytics Inc.'s Open Sesame!" *INFOWORLD*

Open Sesame! is available at these quality resellers: MacWarehouse 800-255-6227, EGGHEAD 800-EGGHEAD, The Mac Zone 800-248-0800, ComputerWare 800-326-0092.

To order direct, call 1-800-913-3535.
For more information, call 617-491-3474 or fax 617-868-0780.

OPEN SESAME!

Charles River Analytics, 55 Wheeler St., Cambridge, MA 02138. Open Sesame! is registered trademark of Charles River Analytics. Macintosh and Apple are registered trademarks of Apple Computer, Inc.

Circle 18 on reader service card

about which movies should or should not be captured on CD-ROM. My advice to Mr. Martin is that he leave the job of reviewing movies to Siskel and Ebert.

Sam Choukri
Columbia, Missouri

A community college in North Carolina at one time offered an accredited course on "The Andy Griffith Show." While I'm sure it was an entertaining class, its subject struck me as not entirely worthy of academic scrutiny. And that's how I feel about A Hard Day's Night—it's great to have a movie to analyze on CD-ROM, and the Voyager product is nicely executed. But in my admittedly subjective opinion, there are hundreds of other films that would make for much more interesting examination, and that's why I included the disc among the "misguided and downright bad CD titles."—J.A.M.

MacTools Needs Fixing

I COULDN'T DECIDE WHETHER TO laugh or cry when I read your four-star review of MacTools 3.0 in the March issue. I had ordered the upgrade, despite the excessive price for a current MacTools user, because I had been pleased with version 2.0; it had solved problems for me that Norton Utilities could identify but could not fix. I received the (supposedly) fixed 3.0a, but very little seemed to work well. In fact, I found the software to be so bad that I returned it for credit to the mail-order house from which I purchased it.

CP AntiVirus simply would not run at all; every time I tried to use it, it would quit with a type 1 error. TrashBack was confusing to implement, and the TrashBack folders somehow became visible on the desktop—much to the consternation of my spouse, who wondered what I was up to *this* time. AutoCheck caused a major degradation in performance even when it was supposed to be "sleeping" and had been set to run only once per day. And finally, CP DiskFix continually found problems in the desktop database that it could not fix and that Norton Utilities 2.0 and Disk First Aid 7.2 didn't even find. I am using a very typical IIci (32-bit clean, math chip installed, and so on) with System 7.1, and I experienced these problems even when starting up with all extensions and INITs turned off.

I will continue to use MacTools 2.0, since I have it, but I would not recommend version 3.0 to anyone until it undergoes a major overhaul.

Steve Parker
via America Online

After I had finished the MacTools 3.0 review, I began to see a number of problem reports posted in Central Point's online support forums. I've been unable to reproduce those problems on my Macs, including those problems mentioned in your letter. Central Point Software has since released maintenance upgrades for several components of the MacTools 3.0 package. You can download updates from Central Point's forums on America Online or CompuServe, or you can get a disk with the updates from the company for a nominal fee.—Tom Negrino

Unicorn Fixes MIDI

IN THE MARCH 1994 *POWERBOOK NOTES*, Cary Lu mentions problems with MIDI on 100-series PowerBooks and implies that Opcode Systems' OMS is the only solution. Mark of the Unicorn has a control panel called Unicorn Power that fixes both PowerBook serial ports (OMS fixes only the printer port) for our MIDI software. This fix is included with our latest versions and is free to registered users of our software.

Neal Lischner
Mark of the Unicorn
Cambridge, Massachusetts

Loyal Customer or Captive Audience?

I AM GETTING UPSET ABOUT THE CONstant upgrade notices I receive. In less than two years, I have spent $90 on upgrades for Aldus's SuperPaint, even though the program now sells new through mail order for $99. Would you believe $400 in 2½ years for Aldus FreeHand upgrades? And Aldus PageMaker is not far behind.

I understand the expense involved in programming and R&D. But why should those who purchased the programs and support the company be hit so hard for upgrades? I use all of the above programs and have upgraded every time I received a notice. Software companies should throw away the stamp that says "Sucker" and use one that reads "Loyal Customer: To Be Treated Fairly."

Alan Ratzburg
San Jose, California

Letters should be sent to *Letters, Macworld*, 501 Second St., San Francisco, CA 94107; via fax, 415/442-0766; or electronically, to CompuServe (70370,702), MCI Mail (294-8078), America Online (Macworld), or AppleLink (Macworld1), or via Internet (70370.702@compuserve.com). Include return address and daytime phone number. Due to the high volume of mail received, we can't respond personally to each letter. We reserve the right to edit all letters. All published letters become the property of *Macworld*. m

IN CONTROL
PLANNER AND ORGANIZER

If you're always looking for faster and better ways to get things done, take a look at the all-new IN CONTROL 3.0. It's the complete planner and organizer for the Mac that can get you totally organized. (Honest!) You see, IN CONTROL is the only Personal Information Manager that combines the award-winning, multi-column Action Outliner™ with full-featured daily, weekly and monthly calendars. The result? You can throw away those little yellow stickies, make short work of long to-do lists and bury that dog-eared calendar.

NEW! VERSION 3.0

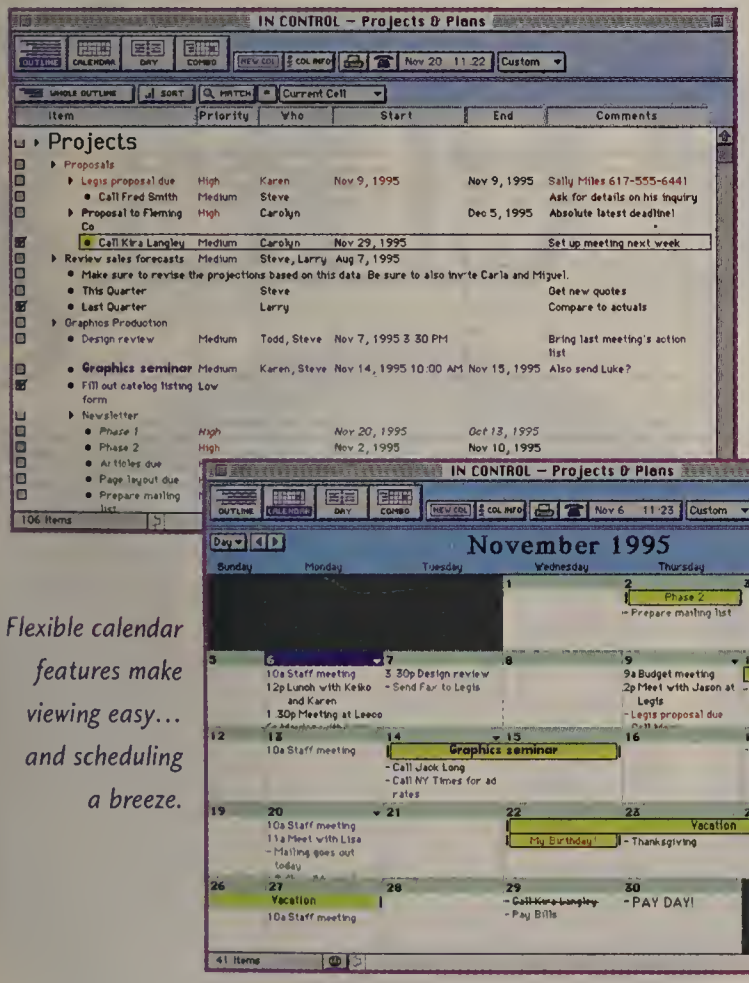
SEVEN GREAT WAYS TO GET TOTALLY IN CONTROL™

1. Spend your time wisely. IN CONTROL is easy to use, so you can dig right in and start planning immediately. And with its fully integrated outline and multiple-view calendars, you can plan, organize and schedule — all at the same time!

Plus, IN CONTROL's handy Lookup feature gives you speedy access to FileMaker® Pro, Touchbase™ Pro, Now Contact™ and Dynodex™. IN CONTROL even dials the phone!

2. Plan smarter and better than ever before. IN CONTROL helps you prioritize everything — in as much detail as you need — so it's easy to choose what's most important to work on first.

3. Be adaptable to change. IN CONTROL's flexible, intuitive interface makes changing your plans, reorganizing your day, shifting responsibilities and rescheduling your appointments a snap.



IN CONTROL'S multi-column Action Outliner™ helps you plan smarter.

Flexible calendar features make viewing easy... and scheduling a breeze.

4. Keep your sense of style. Unlike many "get organized" products, IN CONTROL doesn't force you to change your style. It works the way you work, and provides countless tools to help you get organized faster, better and easier than ever before. You can even print pages to fit the most popular paper organizers.

5. Don't lose sight of the big picture — or the details. IN CONTROL's daily, weekly and monthly calendars allow you to view your activities up to a year at a time, ensuring that all your plans fit with your long-term goals.

With IN CONTROL's new daily views, you can also focus on the details— like your schedule or to-do's for one particular day.

6. Never let anything slip through the cracks again. IN CONTROL can automatically remind you of your most critical tasks, guaranteeing that you won't forget anything. Plus, Auto carry-forward and recurring event features speed up scheduling.

7. Get the all-new IN CONTROL 3.0 risk-free. When you order, you don't risk a penny because IN CONTROL is backed by our ironclad 60-day guarantee of total satisfaction.

60-DAY UNCONDITIONAL MONEY-BACK GUARANTEE. Through participating dealers.

For more information, or site license or volume discounts, call: 1-800-925-5615 or 617-776-1110.

To upgrade, call: 1-800-784-7388 ext. 300.

ATW0694
MacWAREHOUSE
1-800-255-6227

$85
Suggested retail: ~~$129.95~~
BUS0411 IN CONTROL 3.0

Circle 6 on reader service card

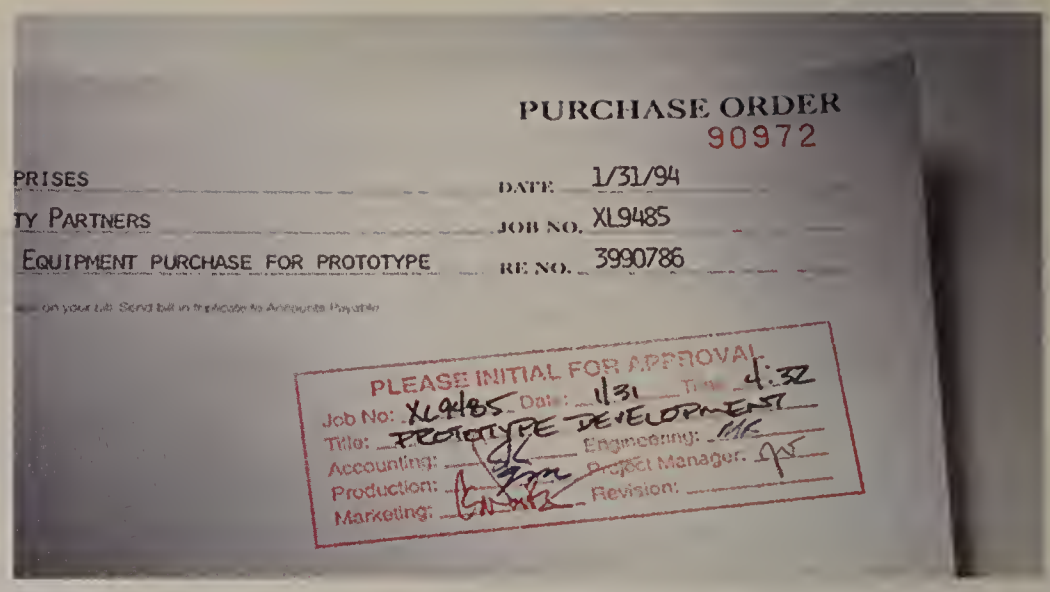
MacWEEK ◆◆◆◆
MacUser ★★★★½
MACWORLD ★★★★

ATTAIN Attain Corporation 48 Grove Street Somerville, MA 02144 USA
TEL: 617-776-1110 FAX: 617-776-1626 Internet: Sales @ Attain.com

©1994 Attain Corporation.
All products are trademarks or registered trademarks of their respective holders.



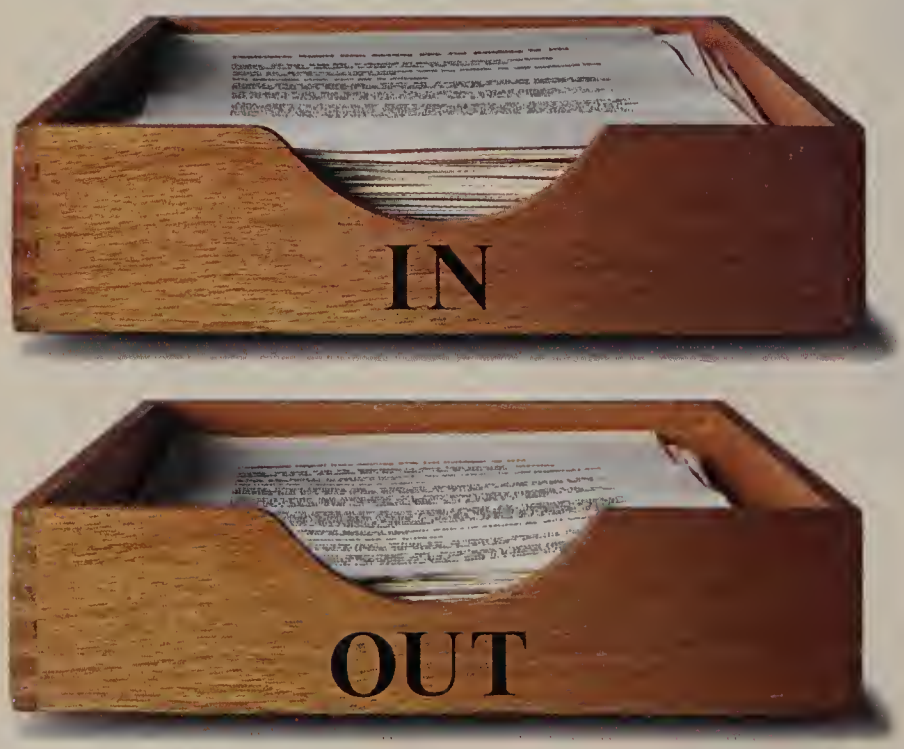
This is Bob, the new employee. Whether Bob works at home or is part of your office network, PowerTalk software makes it easy for him to collaborate with colleagues—without wasting his energy on lots of complex procedures or training. Plus, PowerShare makes network expansion easy for you. So easy, you can add 200 or 2000 more Bobs by simply adding more PowerShare Collaboration Servers.



It takes a lot of effort to physically route paper documents between different departments. With PowerTalk and DigiSign™ software, however, people can now approve things electronically—saving time and money (and, of course, trees).

Announcing conserve energ

PowerTalk, when used with any personal gateway, combines your voice mail, e-mail and faxes into a single universal mailbox. So you can check all your messages in one place (instead of going to the trouble of checking them separately, like you're used to doing).*





You can spend your time and energy learning five different communications programs. Or, you can use PowerTalk, which lets you send faxes, e-mail or any other kind of message, all with one simple procedure—right from the program you're already working in.

*© 1994 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, Macintosh and "The power to be your best" are registered trademarks and DigiSign, PowerShare and PowerTalk are trademarks of Apple Computer, Inc. *Gateways are readily available from other companies, and are sold separately*

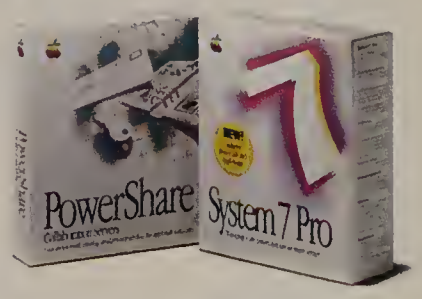


With PowerTalk, sending a simple business letter is the last thing you'd expect: simple. Instead of fiddling with passwords and enclosures, just drag your letter icon onto the recipient's business card icon. PowerTalk does the rest.

It's easier than ever to stay in touch when you're on the road. Just choose who you want to send your document to, and PowerTalk takes care of passwords, phone numbers and how it gets there (fax, e-mail, etc.). So you don't have to waste your energy doing so.



In a world of immovable deadlines and shrinking bottom lines, you've got better ways to spend your energy than fiddling with passwords, enclosures and multiple interfaces. Recognizing this, the engineers at Apple created two of the most helpful networking innovations in the history of personal computing: PowerTalk™ and PowerShare™ Collaboration Servers software. With these improvements, your Macintosh® now automatically does many of the tasks you used to do manually—so you can focus on working with your colleagues, instead of focusing on getting your computers to connect. PowerTalk is the first piece of software



PowerTalk comes standard with System 7 Pro. PowerShare Collaboration Servers software is available separately.

a new way to y in your office.



You install PowerShare server software on a Macintosh or an Apple® Workgroup Server by simply pressing a button. What's more, a PowerShare network is as easy to expand—and maintain—as it is to set up.

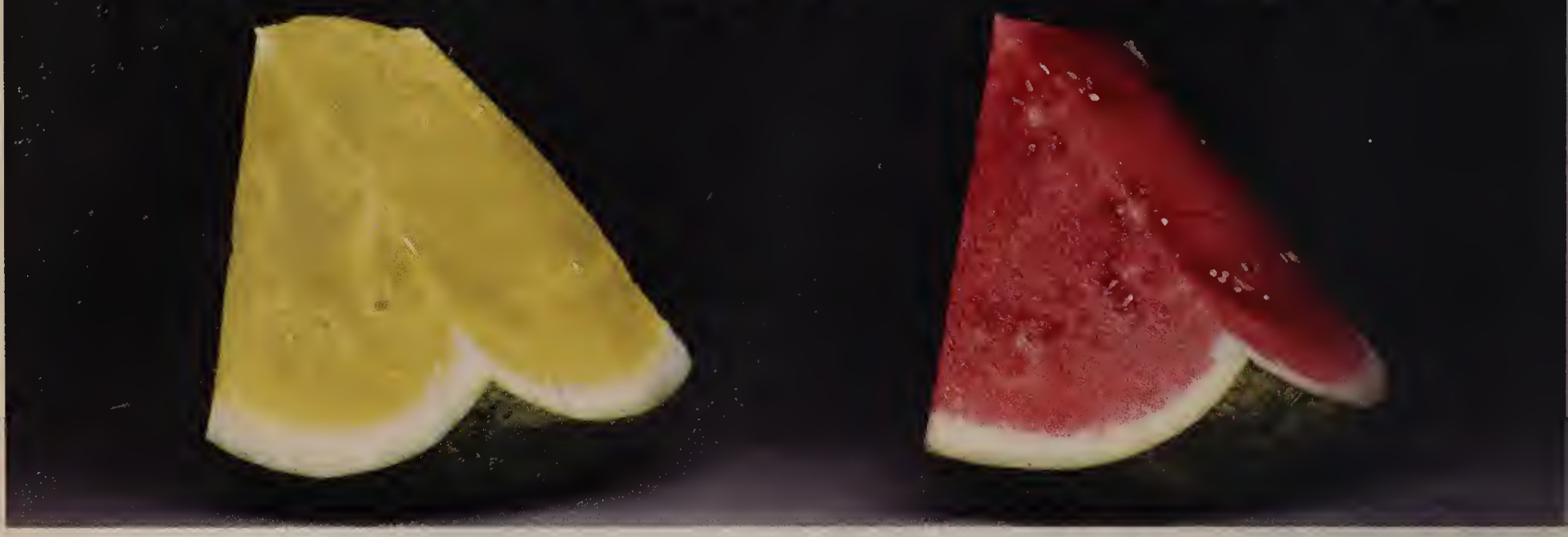
The bigger the network, the greater the need for security. That's why, to ensure total confidentiality, PowerTalk and PowerShare automatically encrypt all messages sent over your network—eliminating extra work and extra worry for everyone.



designed to make collaboration easier for individual users. Instead of bothering with separate voice mails, faxes and e-mails, all communications now reside in a single mailbox. And all messages are sent and received with the mere click of a mouse—no separate programs, no separate passwords. Plus, a catalog feature even lets people keep detailed information on their colleagues: numbers, addresses and instructions on how to send them information. PowerShare makes setting up a network equally simple. The software is easy to install and easy to maintain. Keeping track of people is easy, and adding new people is easy. To see how PowerTalk and PowerShare can help your company, call 800-732-3131, ext. 200, for the name of the authorized dealer nearest you. And discover the power that takes the work out of working together. The power of Macintosh. The power to be your best.®

Introducing PowerTalk and PowerShare from Apple

We Scan Corrected.



You expect a scanned image to accurately reflect the color found in your original. Getting there, however, is usually no picnic. After scanning, precious hours are often spent adjusting the image in software to capture the truest blue, a faithful fuchsia, or for example, just the right kind of red in a ripe watermelon. But DCR™ has changed all that.

Now, when you purchase the **new, low-priced ScanMaker® IIsp single-pass color scanner**, you also get **DCR, Dynamic Color Rendition**, an advanced, yet easy-to-use color calibration and correction system. DCR actually calibrates the ScanMaker IIsp to a photographic industry-accepted calibration target, creating a custom color profile of your specific scanner, ensuring the most accurate color possible as you scan the image. But don't take our word for it. Here's what *PC Magazine* said in their February 8, 1994 issue: "...this mechanism (DCR) seems to have worked well, because the ScanMaker IIsp's color output was clearly the best of any scanner in our survey."

So, even if you need to capture the bright yellow flesh of a Honeyheart watermelon, like the wedge on the left, the quickest way to do it is with the new ScanMaker IIsp with DCR.



For more information about the ScanMaker IIsp, DCR, your nearest authorized Microtek reseller, or a FREE copy of *The Scanned Image* — a scanning primer, call **1-800-654-4160** or fax (310) 297-5050.

The ScanMaker IIsp accurately captures millions of brilliant colors at resolutions up to 1200 x 1200 dpi through software interpolation (300 x 600 dpi optically). In addition to the DCR color calibration/correction system, the ScanMaker IIsp is bundled with ***Adobe Photoshop 2.5 LE*** *for either Windows or Macintosh. Windows users also get* ***Caere's PageKeeper Portfolio*** *document and image management software.*

PC MAGAZINE EDITORS' CHOICE
February 8, 1994
Microtek ScanMaker IISP

IMAGING MAGAZINE EDITORS' CHOICE

Get a hands-on demonstration of the ScanMaker IIsp with DCR and find out more about accurate color scanning by attending Focus Seminars' *"ColorRight, Color Correction & Reproduction Workshop."* For dates and locations, call Microtek at 1-800-654-4160.

MICROTEK
Better Images Through Innovation.

The DCR color calibration / correction system is a proprietary system of Microtek Lab, Inc., The following are trademarks or registered trademarks of their respective companies: Microtek, ScanMaker and DCR (Dynamic Color Rendition) of Microtek Lab, Inc. Adobe Photoshop LE of Adobe Systems, Inc. PageKeeper Portfolio of Caere Corporation. SMIISP294

Circle 287 on reader service card

LATE-BREAKING NEWS

MacBulletin

LC 575 Reborn as Performa As expected, Apple is bringing out Performa models of its 33MHz, 68040-based LC 575 (see "Apple Ships First All-in-One 040 LC," *Macworld News,* April 1994). The new all-in-ones are the Performa 575, which has a 250MB hard drive and 5MB of RAM; the 577, which has a 320MB hard drive and 5MB of RAM; and the 578, which has a 320MB hard drive and 8MB of RAM. All have an internal tray-loading double-speed CD-ROM drive and bundled software including ClarisWorks 2.0, Quicken 4.0, Macintosh PC Exchange, Best of Homeworks Templates, ClickArt Performa Collection, America Online, At Ease, American Heritage Dictionary, Mario Teaches Typing, Spectre Challenger, and SuperMunchers. Bundled CD-ROM titles include Grolier's Encyclopedia, 1993 Time Magazine Almanac, Dinosaurs, and Wacky Jack's CD Game Show. The new Performas should ship to mass-market channels by early May. Prices will vary by reseller.

Novell Acquires WordPerfect Possibly creating a software behemoth to rival Microsoft, Novell is acquiring WordPerfect Corporation (a move that requires government approval) and has bought the Quattro Pro spreadsheet from Borland International. Novell gained the right to distribute 1 million copies of Borland's Paradox database. This should heat up the software-suite battle, where Microsoft currently leads.

Some Slowdowns on Power Macs Reports are circulating that the Power Macs' SCSI and NuBus have flaws that make these Macs transfer data more slowly than Quadras. However, Macworld Lab's investigation shows that the slowdown occurs only for very fast systems, such as some disk arrays and video cards, and in most cases is caused by the lack of an updated driver from the array or card vendor. Vendors we contacted planned to have updates shortly.

100MHz PowerPC Upping the ante in the processor wars, IBM and Motorola plan to begin shipping a 100MHz version of the PowerPC 601 chip in large numbers in the fourth quarter. The chip is up to 25 percent faster than the speediest existing version (80MHz) and uses only 4w of power; the original 601 uses 8w. Motorola also cut prices on its PowerPC 601 chips.

Quark Extends PowerPC Upgrade Quark has changed its PowerPC upgrade plan, which had drawn criticism from users. Previously, users had until July 1 to buy the PowerPC upgrade (due in early summer) of QuarkXPress 3.3 for $199; after that, the price would be $999. Now, Quark will offer the $199 price until October 1, raise the price to $229 until December 31, and go to $999 after that.

America Online Adds Capacity After being swamped by new subscriptions, America Online said it has increased its computer capacity by about 50 percent. Many subscribers had reported being unable to get through. The company also now offers 9600-bps access from Macs. 800/827-6364.

Applied Engineering Collapses Applied Engineering—vendor of upgrade boards and accessories—has gone out of business. Separately, Interex Computer Products said it had bought Applied Engineering's remaining battery chargers for PowerBooks and will resell those and then make them under its own name. Interex, 316/524-4636.

Golden Triangle Folds Disk-drive-utility vendor Golden Triangle is reorganizing and has already laid off most of its employees, making tech support "extremely difficult if not impossible," according to the company. A Golden Triangle executive said the company has not charged any customer credit cards since January. 619/587-0110. m

News

EDITED BY TOM MORAN

IN THIS ISSUE

p. 37 Adobe, Aldus to Merge **p. 37** Apple 17-inch Monitor **p. 38** Premiere 4.0
p. 38 QuickTime 2.0 **p. 39** Claris Safety Utilities
p. 40 Orange Micro 486 Board **p. 40** Director 4.0 **p. 40** Optical Disc Array

Apple Tells Its Software Future

Saying it intends to increase the Macintosh's market share, Apple recently detailed its upcoming system software offerings and outlined the future of Macintosh Operating Systems. The company said it plans to move from today's passive user interface to active assistance for greater productivity, from networks to collaboration for effective teamwork, from today's monolithic applications to component-based software (OpenDoc) for faster custom solutions, and of course, from CISC (680X0) to RISC (PowerPC) for improved price/performance.

Beyond the latest System version, 7.1.5, Apple expects to introduce the following:

• System 7.5, which should appear this summer in versions for 680X0-based Macs and Power Macs. System 7.5 will add Apple Guide (the first instance of active assistance), a scriptable Finder, drag-and-drop for fast printing and other automatic processing of files, the famously overdue QuickDraw GX, multithreading (a first step toward multitasking), PowerTalk collaborative communications software, MacTCP, file-synchronization management, and software for easier translation of DOS and Windows files.



WILL CROCKER

• OpenDoc, once code-named Amber (see "Amber: beyond Applications," *News*, September 1993), started at Apple but later moved to Component Integration Laboratory (CILab), the consortium charged with making OpenDoc a standard across multiple hardware platforms. With OpenDoc, users will never have to leave the compound document they're working on. If a user decides to add a chart, OpenDoc will access a charting component. The obvious advantage is not having to open and close a lot of huge applications to make changes. The less-obvious advantage is that users can choose among competing charting components, for example, as well as mix components from different vendors in a way that's not possible now. OpenDoc may also encourage creative software, since a small developer could sell a clever component without building a huge monolithic application around it.

Current members of the CILab consortium include Apple, IBM, WordPerfect, Novell, Oracle, Sun, Xerox, and Taligent. CILab is encouraging Microsoft to participate in OpenDoc, and Microsoft and Apple recently agreed to divvy up the tasks involved in building bridges between OpenDoc and OLE, Microsoft's equivalent of OpenDoc. OpenDoc software developers' kits (SDKs) are due this fall. Applications should take at least six months to show up after SDKs are available for a given environment.

- Copland, also known as "System 8," is expected in 1995. Copland will add improved active assistance; cooperative multitasking; memory protection to reduce conflicts from multitasking; and "a new I/O architecture," probably incorporating the newish PCI bus and/or FireWire, the high-speed serial bus that may replace SCSI, existing serial ports, and the Apple Desktop Bus (ADB).
- Gershwin is expected in 1996. The Gershwin operating system will mark the appearance—finally—of true preemptive multitasking on the Mac, but software developers will have to rewrite their applications to take advantage of that capability. Gershwin will also provide intelligent assistance, which observes what you do and makes suggestions, and advanced graphics with cut, copy, and paste. Apple is designing Gershwin to have a microkernel architecture, which means it will have core code designed for easy portability to various hardware platforms. Apple's microkernel will probably not be identical to IBM's proposed standard WARP microkernel, because WARP is too big to fit on an affordable entry-level system, according to an Apple representative. However, the Apple microkernel may be a subset of the WARP kernel, so that applications written for Gershwin would still run if Apple later decided to move to the full version of WARP.
- The object-oriented, platform-independent Taligent operating system from the joint venture of Apple, IBM, and Hewlett-Packard will be interoperable with OpenDoc but is probably still several years away.
- David Nagel, senior vice president and general manager of Apple's AppleSoft division, suggested that the high performance of PowerPC chips would make qualitative changes possible in the user interface, possibly including speech input and output or multiple 3-D graphics environments that would replace or supplement today's desktop metaphor.—T.M.

Adobe, Aldus to Merge

NEW PUBLISHING TITAN

Adobe Systems and Aldus Corporation—two leading makers of desktop publishing software—announced a definitive agreement to merge, subject to approval by shareholders in July and by the Federal Trade Commission.

The new company—still unnamed at press time—will become the fifth-largest software vendor, with $500 million in annual sales. Adobe chairman and CEO John Warnock and president Chuck Geschke will keep their positions, and Aldus chairman and president Paul Brainerd will serve on the board.

Both companies "plan to continue all of our products currently in the marketplace for the foreseeable future," said Brainerd, noting the overlap between Aldus FreeHand and Adobe Illustrator. However, outside sources speculate that the rights to FreeHand could revert to Altsys, FreeHand's developer. (For a comparison of these draw programs, see "FreeHand vs. Illustrator," in this issue.)

Jim von Ehr, president and CEO of Altsys, said a merger would not invalidate Aldus's rights to FreeHand, but that Altsys would not "sit back and let FreeHand become the number two product." Companies have shown an interest in acquiring FreeHand from Altsys over the years, he noted, saying only that "all possibilities are open to us now."—JAMES A. MARTIN

Apple 17-inch Display

MULTIPLE-SCANNING COLOR MONITOR

Since the days of the 9-inch display, the world has shrunk and monitors have grown. The midrange of Apple's monitor lineup is now the Multiple Scan 17 Display, the company's second multiresolution color monitor. Based on a 0.26mm stripe-pitch Trinitron tube, the Multiple Scan 17 can handle multiple resolutions from 640 by 480 pixels (standard 13-inch size) up to 1024 by 768 pixels at 75Hz. The monitor can also display a range of resolutions at 60Hz, including VGA and SVGA, and it ships with an adapter that connects it to PC-compatible systems.

Users can adjust everything from brightness and contrast to convergence and

continues



MARK JOHANN

The Apple Multiple Scan 17 Display offers a wide range of resolutions, including VGA and SVGA.

In Brief

Apple's Cheaper CD-ROM Drive

Apple has unveiled the AppleCD 300e Plus external CD-ROM drive and the 300i Plus internal CD-ROM drive, which the company says are as fast as the current 300e and 300i models and offer a motorized loading tray and a lower direct price. The price of the 300e Plus was expected to be about $349, while the 300i Plus was expected to be around $319. They replace the existing models. 408/996-1010.

Apple Speakers: The Sequel

Apple's new AppleDesign Powered Speakers II are about a third smaller than the company's existing speakers. Available now for $79 in black, the speakers also come in platinum with Apple's new Apple Multimedia Kit for Macintosh. When it ships in May, the $449 kit will include an AppleCD 300e Plus CD-ROM drive (see above), headphones, Compton's Interactive Encyclopedia, and a choice of three software titles.

DGR Cuts Optical Price

DGR Technologies has dropped the price of its 256REM 256MB removable optical drive to $1099. The drive ships with one 256MB cartridge, all cables, and CharisMac driver software. 512/476-9855, 800/235-9748.

24-Hour Tech Support

Digital Equipment Corporation's $149 Service-in-a-Box provides toll-free, 24-hour unlimited technical support for a year on more than 450 Mac and PC applications including ACI US's 4th Dimension, Adobe Illustrator and Photoshop, Aldus PageMaker and FreeHand, Claris FileMaker Pro, Lotus Notes, QuarkXPress, and just about any Microsoft app. Service-in-a-Box is itself intended as a first line of defense, but live operators are standing by at all times. 603/884-4304, 800/722-9332.

pincushion with digital controls, and the monitor remembers the settings for different resolutions and reverts to them when you select that resolution. A total of ten different resolutions are available: eight factory preset and two user-definable. Apple also includes the new Display Manager and Monitors control panel with the Multiple Scan 17, so that users can make such resolution switches without restarting the Macintosh. With the new software, users will also be able to switch between active monitors and shuffle the virtual-desktop layout without restarting. These capabilities depend to a certain degree on the available video-display hardware and may not work on older Macs. Display-card manufacturers may also have to update their boards. Finally, users concerned about color precision may choose from three white points (5500K, 6500K, 9300K), and the display's ColorSync profile is included.

The Multiple Scan 17 has the same tilt-and-swivel base as the 16-inch Apple monitor it replaces; users will find ADB jacks in the back and headphone and microphone jacks located in the front for easy access. The Multiple Scan 17 Display also complies with the MPR II and Energy Star guidelines. At a direct price of $1069, this monitor is right in the thick of the 17-inch multiresolution color market. Apple Computer, 408/996-1010, 800/776-2333.
—CAMERON CROTTY

Big-Screen Multimedia Monitor

NEC Technologies introduced the MultiSync 4PG, a 27-inch monitor designed for multimedia and presentations. The display accepts input from Macs, PCs, VCRs, and video cameras, in VGA, XGA2, NTSC, M-NTSC, PAL, and S-Video formats. The monitor uses a flat-square CRT tube with several resolutions, ranging from 320 by 200 pixels to 1024 by 768 pixels (at 60Hz). The Energy Star–compliant monitor comes with a remote control and is available now. NEC estimates that the monitor's street price will be around $3695. 708/860-9500, 800/632-4636.—T.M.



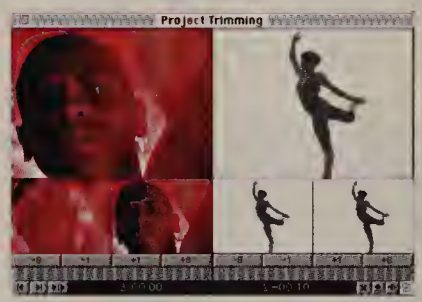
MARK JOHANN

Adobe Premiere 4.0

SUPPORTS ROLLING EDITS

A new window here, a new filter there, and a raft of small improvements all add up to Adobe's 4.0 release of its Premiere digital-video-editing software.

Accurately controlling the timing of a transition between two clips used to be a time-eating chore, but a new Trim window makes for easier and more-precise rolling edits. Premiere displays the video clips side by side, and you can opt to see just the current frame or to simultaneously look forward or backward in each clip by one or five frames, for instance while you adjust the transition point.



Premiere 4.0 adds a Trim window for rolling edits, and supports filters that vary with time.

Previews from the Construction window now appear almost instantly; clips with as-yet-unrendered effects appear with hash marks through them, but you can get a quick idea of what your work will look like without taking a forced coffee break while Premiere assembles a preview.

Premiere 4.0 users can look forward to filters that vary over time, as well as the availability of filters from Photoshop 2.5. And whether you're previewing a project, a clip, an effect, or a trim edit, you can opt to send the output to the Preview window, which could, for instance, be moved to an NTSC monitor to more closely simulate final output. The Preview window is one of several windows that can be designated as floating, meaning that they remain in the foreground even when you click in another window.

Premiere 4.0 also features a laundry list of minor revisions, including a pop-up tool palette that's available from the Construction window, autosave, batch processing, the capability to work at true 29.97 frames per second, and improved handling of audio edit decision lists. The software should be available now on CD-ROM disc only in fat-binary format (a combined 680X0 and Power Mac version) from Adobe for $795. Owners of Premiere 3.0 will be able to upgrade their software for $129. Adobe Systems, 415/961-4400, 800/833-6687.
—CAMERON CROTTY

THE AMCOEX INDEX OF USED MAC PRICES

Machine/RAM/Hard Drive	Average Sale Price	Monthly Change
PowerBook 100/4MB/20MB	$800	+$50
PowerBook 140/4MB/40MB	$1050	+$50
PowerBook 180/4MB/80MB	$1700	$0
PowerBook Duo 230/4MB/80MB	$1200	+$50
Mac Classic/2MB/40MB	$425	+$25
Mac SE/30/2MB/40MB	$575	–$25
Mac LC II/4MB/40MB	$525	+$25
Mac IIsi/3MB/40MB	$625	+$25
Mac IIci/4MB/80MB	$875	–$50
Mac IIfx/4MB/80MB	$1050	–$50
Centris 650/8MB/230MB	$1300	–$50
Quadra 900/8MB/160MB	$2400	–$50

Index provided by the American Computer Exchange of Atlanta, Georgia (800/786-0717). It reflects sales during week of March 21. Configurations include keyboard and exclude monitor and display board for noncompact models.

QuickTime Ready for Prime Time

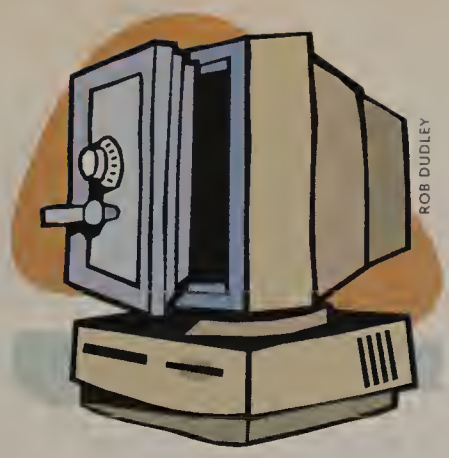
OFFERS PRO VIDEO FEATURES

Apple plans a midyear update to its QuickTime multimedia extension that will offer improved performance for all Macs, new features for video developers, and support for interactive television.

QuickTime 2.0 will let Macs play movies twice as fast as the current version, 1.6.1, according to Apple, with a data-throughput rate that will be increased from 1 MBps to 3 MBps. With 2.0, an 030-based LC 475 should be able to play back a 320-by-240-pixel movie at 30 frames per second, or a 640-by-480-pixel movie at 15 fps. Apple will also add a MIDI-like Music Track along with built-in support for 60-field video and time-code.

QuickTime 2.0 will allow editable, searchable, MPEG-

compressed video, and will support network distribution of movies. Apple hopes this capability will popularize full-length movies on CD-ROM discs, video servers, and the information superhighway. Apple Computer, 408/996-1010.—JIM FEELEY



Claris Weaves Safety Net

UTILITY SOFTWARE SERVES AND PROTECTS

Designed as a safety net for unsophisticated users, Claris's Safety Suite consists of 13 utilities that can preserve and recover data, guard against unauthorized access to files, and provide hard-to-remove identification for lost or stolen Macs.

Security-conscious users can password-protect their hard disk drive, encrypt selected files and folders, completely erase or "shred" files so they are completely unrecoverable instead of just throwing them in the Trash, and monitor and log network access to their Macintosh. While your Mac is on but you're not there, a screen locker prevents busy hands from peeking at your data and provides a way for honest, upstanding visitors to leave messages for you. As part of the screen locker, a customizable message appears at the bottom of the display, identifying your machine in case of loss or theft.

Safety Suite can also protect your data from computer gremlins, automatically saving your files at intervals you specify and backing up your data when your Mac is idle (both features can be set to retain multiple versions of your documents). An undelete utility recovers those accidentally trashed files, and a Crash Protection feature records your keystrokes for last-ditch data rescue. The What Happened utility maintains an audit trail of machine activity to help you figure out what caused the joint-cracking system lockup you just experienced. Safety Suite is currently available for $99 from Claris Clear Choice; 408/987-7000, 800/325-2747. —CAMERON CROTTY



Safety Suite includes 13 safety and security utilities for the Macintosh.

BUGS & TURKEYS

Aldus has posted online FreeHand 4.0a, a patch to 4.0 that fixes several problems users encountered with printing, conversions, and font handling.

Microsoft is working on an upgrade to FoxPro that will address problems users have had with out-of-memory errors and printing to QuickDraw printers. The upgrade will be FoxPro 2.5c, and Microsoft expected to release it by the end of April. Microsoft says a free maintenance fix should be available by the time you read this.

Apple's $10,749 Professional Video Production Solution, a bundle of video-editing hardware and software introduced in January, requires a PDS slot for its storage array controller board. But Power Macs don't have PDS slots. And Apple's PowerPC processor upgrade board for existing Quadras needs their only PDS slot. How will power-hungry video professionals move to PowerPC? Apple is aware of the dilemma.

When America Online users try to create private discussion rooms with titles containing the character sequence *s*, *e*, *x* (including, for example, *Safe Sex* and *Essex*), they can't; instead they get a message that vulgar room names can result in account cancellation. Responsible citizens and Anglophiles are out of luck.

Macworld will send you a Bug Report T-shirt if you are the first to inform us of a serious, reproducible bug that we report in this column, or a Turkey Shoot T-Shirt if we shoot your turkey in this space. See *How to Contact Macworld*.

Video Director

ASSEMBLE AND EDIT VIDEO CLIPS

Manually assembling an edited tape from source clips is a big pain, so Video Director for Macintosh 1.5 uses a special cable that plugs into your Mac's serial port to pipe commands to a camcorder (either LANC- or VISCA-compatible) and an infrared-controllable VCR. The VCR and the camcorder are directly connected with audio/video patch cords, and the camcorder acts as a source deck, while the VCR acts as a record deck. You control the source deck via a window that displays VCR-style controls. When you find a segment of video that you like, you mark its start and end points, and then Video Director remembers where it is and what tape it's on. When you've identi-

continues

In Brief

Bigger SyQuest

The latest in 5¼-inch removable-cartridge drives from SyQuest is the SQ5200C, which uses the company's 200MB cartridges. The device can also read from and write to existing 44MB and 88MB SyQuest cartridges. Now available to peripherals vendors who will begin reselling it soon, the drive should start at a street price of around $599, including one cartridge, according to SyQuest. 510/226-4000, 800/245-2278.

Cheaper Bernoullis

Iomega has lowered the suggested retail prices of its Bernoulli 90 removable storage drives and 90MB cartridges. The Iomega MacTransportable 90 Pro now lists for $419 (down 29 percent), and the MacTransportable 150 now lists for $589 (down 16 percent). Single 90MB removable cartridges are now available for $112, Tripacks for $323, and MultiDisk 150 Tripacks for $336. 801/778-1000, 800/456-5522.

500MB PowerBook Drive

Microtech International is shipping two high-capacity internal hard drives for PowerBooks and Duos. The RoadRunner 250i and RoadRunner 500i store 250MB and 500MB, respectively. The 250i lists for $389, and the 500i goes for $749. 203/468-6223, 800/626-4276.

Image Analyst

MathWorks' MATLAB computation, data-analysis, and modeling environment now has a tool for analyzing, filtering, and enhancing images and other two-dimensional signals—MATLAB Image Processing Toolbox. The $895 toolbox includes more than 100 functions for linear and nonlinear filter design; filtering and image restoration; image enhancement; image analysis and statistics; 2-D transforms; and color, geometric, and morphological filtering. 508/653-1415.

fied all the clips you want on your final tape and arranged them on the event list, you click on Make Tape, and Video Director assembles your final tape, prompting you for different source tapes as necessary.

You can save event lists, and logging a clip automatically adds it to your clip library, from which you can recall it at any time. Video Director 1.5 for Macintosh is available for $199.95 from Gold Disk; 408/982-0200, 800/465-3375.

—CAMERON CROTTY

Pinnacle's Optical Array

STORES UP TO 5.2GB

The Orray from Pinnacle Micro is an optical array that works more like a fast hard drive than a collection of optical drives. The Orray comes in models that have two or four drives: each high-speed erasable optical cartridge functions like a platter in a hard drive. Data is multiplexed through custom ASIC chips to each disk surface by a RISC processor–based master controller. According to Pinnacle Micro, the data is simultaneously read from or written to all the surfaces by using a large data cache. The company said it has applied for a patent on the multiplexing technology. A different mode accepts any 5.25-inch standard optical media cartridge up to 1.3GB. Estimated prices for the Orray optical drive array without media are $7995 for two drives, and $14,000 for four drives. The company recommends using an uninterruptible power supply. Pinnacle Micro, 714/727-3300, 800/553-7070.

—TIM WARNER



SCOTT PETERSON

The Orray optical array from Pinnacle can store up to 5.2GB when configured with four 1.3GB erasable optical drives.



Macromedia's Director 4.0 features improved security and a revised interface with support for up to 32,000 cast members.

Macromedia Director 4.0

IMPROVED AUTHORING TOOLS

Macromedia has announced Director 4.0, the first upgrade to the company's popular multimedia authoring product since 1992. Expected to become available at the end of March, Director 4.0 now offers improvements in memory management, a revised user interface, added support for up to 32,000 cast members and up to 48 channels, and increased security features. The company has revised Director 4.0 so that users cannot use ResEdit to break into the player files as had been possible in previous versions of the software. The authoring program's file-size limit (previously 16MB) has been eliminated, and Lingo, the built-in Macromedia scripting language, also now includes object-oriented commands and expanded mathematical functions.

Director 4.0 has a suggested list price of $1195, and current registered users can upgrade to the new version for $199 until August 31.

Macromedia expects to ship the first-ever Windows version of Director sometime late this summer, and existing and future Director files will be compatible across both platforms. The company expects to introduce support for PowerPC Macintoshes in a future revision. Macromedia, 415/252-2000, 800/945-4061.

—JOANNA PEARLSTEIN

TREND

Fast 486 PC in Your Mac

ORANGE MICRO CARD FOR 680X0, POWERPC MACS

Orange Micro has revamped its OrangePC line of PC coprocessor cards to include Intel's 66MHz 80486DX2 CPU, as well as its 33MHz 486DX and 33MHz 486SX CPUs. The CPU chips are user-upgradable, including to the new Intel DX4 CPUs, which run as fast as 100MHz. The cards work in any Mac that accepts 12-inch NuBus cards; this includes the Mac II series, all the Centris and Quadra Macs except the 610, and all the Power Macs except the 6100.

The OrangePC cards come in three models: all three support up to 64MB of system RAM via a standard 72-pin SIMM slot. The 210 offers one serial and one parallel port, as well as standard VGA video (640-by-480-pixel resolution at 16 colors). The Model 250 has one PCMCIA slot (which accepts Type I and Type II cards) and supports SuperVGA video (up to 1024-by-768-pixel resolution at 256 colors), while the Model 290 has a PCMCIA slot and parallel and serial ports plus SuperVGA video. You can access the PCMCIA slot through the Mac's back panel, so you need not open the Mac's cover to change peripherals, as previous OrangePC cards required. To use the serial and parallel ports on the Model 290 requires an optional cable.

Because the OrangePC is a PC running inside the Mac's case, programs can continue to run in one system while the user has switched to the other system. The card does share video display and hard drives with the Mac, although a dedicated hard drive can be added via the PCMCIA slot for the Models 250 and 290.

The OrangePC software is in fat-binary format, so it works with both 680X0 and Power Macs in native mode. With the software, the card can access the Mac's files through standard DOS and Windows commands. It can read virtual DOS hard disks created by Insignia Solutions' SoftPC and SoftWindows DOS emulators.

The OrangePC cards are shipped with MS-DOS 6.2; Windows must be purchased separately. Expected prices range from $999 for a 33MHz 486SX-based Model 210 with 4MB of RAM, to $2000 for a 66MHz 486DX2-based Model 290 with 16MB of RAM. Orange Micro, 714/779-2772.

—GALEN GRUMAN

Should the New MiniCad 5 be your CAD Program?

Take the Quiz.

- I want a full-featured, proven market leader which can handle any job: 2D, 3D, cost estimation and client presentations.
- I want a program that runs on both the 68K-based Macintosh and the Power Macintosh. At no extra charge!
- I want a CAD program that is tailored to my needs, with specialized tools for architecture, mechanical engineering and design.
- I want an expandable CAD program which can be customized for specific solutions easily and inexpensively.
- I don't want to spend a lot for training or experience an enormous learning curve.
- I want an established company with constant R&D funding, so that my investment stays safe.





Accelerated for Power Macintosh

3 Free Application Specific Modules

Mechanical, Architectural, & Advanced Design

MiniCad 5 offers all of the above and more. The award-winning software has been hailed as the "features champion" by Macworld Magazine (March, 1993). Further, Graphsoft is dedicated to aggressive investment in CAD R&D. Graphsoft customers stay more productive than their competitors because Graphsoft supports both the latest technology and evolving user needs. MiniCad has long been the price/performance leader in Macintosh CAD. Don't be steered away from MiniCad by VARS who want you to buy high-priced CAD products that are hard to learn and only do a few things well. The VARS won't tell you that MiniCad 5 ships with a multi-media training CD, or that you receive 18 months of free technical support with Graphsoft products or upgrades. In short, MiniCad keeps more of your money in your pocket. Buy MiniCad 5 and save!

MiniCad 5 also includes: speed increases up to 100% even on 68K-based Macintoshes, a Claris CAD conversion program including a $495 upgrade price, a Claris CAD translator, and a helpful conversion guide, translators for importing and exporting to the other major CAD products, an upcoming Windows version, multi-media training CD 18 months of free technical support and a no-hassles 30-day money-back guarantee through authorized dealers. Contact Graphsoft today for detailed literature. To order immediately, call MacWarehouse, MacConnection, or your local dealer. Demo: $19.00Buy MiniCad 5 and save!



Also from...

Diehl Graphsoft Inc.

Graphsoft



Azimuth

The ultimate map creation tool, including nine cartographic projections and more! Used by US News & World Report. 4 mice

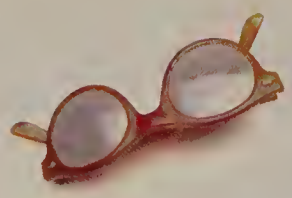
Blueprint

Full-featured 2D drafting. Experience ease of use, high precision and an affordable price. 4 mice. MacWorld Editor's Choice!

10270 Old Columbia Road, Suite 100, Columbia Maryland 21046 Ph:410-290-5114 Fax: 410-290-8050

Power Macintosh is a trademark of Apple Computer Inc. MiniCad, Blueprint, and Azimuth are trademarks of Diehl Graphsoft, Inc.
Claris CAD is a trademark of Claris Corp.

Circle 46 on reader service card

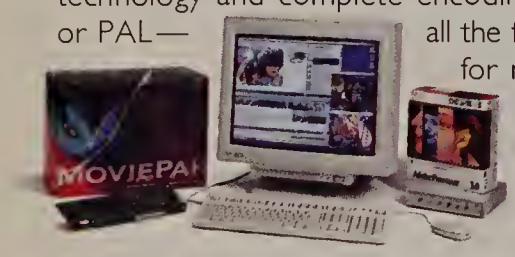


You're not seeing things clearly with the other guy's digital video on a large screen, because they only support 8-bit color.

You'll see much more with a **RasterOps MoviePak2 Pro Suite:** Full-motion video in true 24-bit color on up to 21-inch monitors. And all the stuff pros take for granted — QuickDraw™ acceleration, device control, RGB input — are not to be seen on Radius VideoVision Studio.™

Affordable digital video with a professional focus

MoviePak2 Pro Suite™ is a turnkey solution for expert video: Full-motion, full-screen [60 fields at 640 x 480] compression/decompression, unparalleled RasterOps 24XLTV display technology and complete encoding capabilities for NTSC or PAL — all the features professionals look for most. And we'll give you Adobe Premiere™ — the Macintosh® professional's choice for QuickTime™ video editing — for free.



If you're just getting started in multimedia, **MoviePak Presenter**™ delivers 24-bit QuickTime capture and playback at half the price of the other guys. And we'll throw in Avid VideoShop,® making this a spectacular value for multimedia presentations and CD-ROM authoring.

MoviePak Presenter provides quality video at matinee prices; **MoviePak2 Pro Suite** gives you millions of colors on large-screen displays. See for yourself. For a RasterOps reseller near you, call **1-800-SAY-COLOR.**



FEATURES	RASTEROPS MOVIEPAK2 PRO SUITE	RADIUS VIDEOVISION STUDIO*	RASTEROPS MOVIEPAK PRESENTER
True 60 field/sec (640 x 480) video capture & playback	YES	YES	30-field capture 60-field playback
24-bit color on large screen displays up to 21-inch at 1152 x 870	YES	NO	NO
QuickDraw acceleration	YES	NO	NO
Pro Features: Device control	YES	NO	Optional encoder with genlock for $649
SMPTE time code	YES	NO	
RGB video input	YES	NO	
Price	$4199	$4499	$1799

RASTEROPS®

2500 Walsh Avenue • Santa Clara, California 95051

©1994 RasterOps Corporation. All rights reserved.
MoviePak Presenter and MoviePak 2 Pro Suite are trademarks of RasterOps, and all trademarks and tradenames are property of their respective owners.
*Prices and features as of 2/1/94. All prices are US suggested retail.

IF YOU'RE USING THE OTHER GUY'S VIDEO EDITING SYSTEM, THERE'S SOMETHING WRONG WITH YOUR VISION.



Circle 90 on reader service card

PowerPC News

Next PowerPC Chip on the Way

IBM, MOTOROLA PRODUCE FIRST SAMPLES OF THE 604

IBM and Motorola have both produced the first units of the PowerPC 604 CPU, the eventual successor to the 601 used in the current Power Macs. IBM expects full production from the two companies' fabrication plants by October. Apple has said that it will use the 604 in some second-generation Power Macs, expected in early 1995.

The 604 will initially be available in a 100MHz version, although faster and slower variants are planned.

In low-level tests, the 604 is about 200 percent as fast at integer calculations as the 601, according to IBM. For floating-point calculations, it is only 120 percent as fast. IBM decided to focus on integer speedup on the 604 because that's the most common type of calculation a CPU makes.

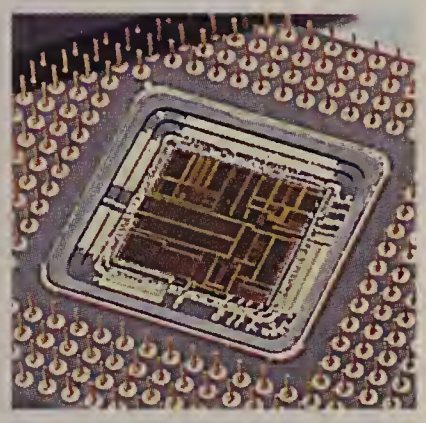
The 604 consumes 10 watts of power, compared with the 601's 8w, the 68040's 5w, the 60MHz Pentium's 12w, and the 90MHz Pentium's 4w. IBM has also produced a 4w, 100MHz 601 CPU, which should ship in quantity this fall.—GALEN GRUMAN

90MHz Pentium

INTEL'S CHALLENGE TO POWERPC FALLS SHORT

A week before the introduction of the PowerMacs, Intel unexpectedly announced—almost three months earlier than originally planned—its power-efficient 90MHz and 100MHz Pentiums; and it began shipping them in limited quantity in early March.

Macworld Lab tests on a prototype 90MHz Pentium PC show that it is still slower than both the Power Mac 7100/66 and 8100/80.



Intel's new Pentium is better, but no match for PowerPC.

Code-named the P54C, the new Pentium 735 and 815 CPUs use 3 to 4 watts of power—that's less than a Motorola 68040 or IBM PowerPC 601. PC makers have already shown prototype systems based on the new Pentiums, but the CPUs' prices are high ($849 and $995, respectively: more than twice an 80MHz PowerPC 601's price. However, Intel plans to lower prices on a quarterly basis.

Intel also released clock-tripled $475 75MHz and $580 100MHz versions of its 486DX chip called the IntelDX4 319 and 435. Both the new Pentiums and DX4s are designed to work in notebook as well as desktop PCs.
—GALEN GRUMAN

MW LAB

New 90MHz Pentium: No Match for Top Power Macs

Best result in test. Times are in seconds. Shorter bars are better. Products are listed in decreasing order of overall perfomance.

	APPLICATION TESTS				OVERALL
	Photoshop 2.5 File opens, unsharp mask, and RGB-to-CMYK conversion.	PageMaker 5.0 File opens and font changes.	Painter 2.0 Apply surface texture and adjust dye concentration.	Mathematica 2.2.1 Computations and their graphical rendering.	Times as fast as a 66MHz 486DX2 PC Weighted average of all results.
Power Mac 8100/80	30.2	26.3	6.0	227.3	2.1
Power Mac 7100/66	31.7	28.7	7.0	283.4	1.9
Intel 90MHz Pentium PC	72.8	21.1	9.2	334.0	1.6
Power Mac 6100/60*	35.9	35.4	8.3	425.0	1.5
Compaq Deskpro 5/60M	54.0	22.8	12.7	395.0	1.4

*The Power Mac 6100/60 was the only system tested without a 256K cache. On the Power Mac 6100/60 and 7100/66, the cache is optional.

BEHIND OUR TESTS Macworld Lab compared Power Macs against Windows PCs using top Intel CPUs. a 60MHz Pentium 510 in a Compaq Deskpro 5/60M and a 90MHz Pentium 735 in an Intel-manufactured prototype PC. All systems had 16MB of RAM, and we ran them in 16-bit color (the PCs used a Diamond Computer Systems SpeedStar Pro video card). We used beta versions of native PowerPC software for the Power Macs and current versions of Windows software for the PCs. (When PowerPC software ships, Power Mac performance should be somewhat higher.) Disk access was fairly sluggish on the Intel prototype (as the Photoshop results show), so shipping PCs based on the 90MHz Pentium should be faster—closer to Power Mac 7100/66 performance.

Power Watch

THE LATEST PRODUCTS FOR THE POWER MACS

Apple has announced prices for its Power Mac upgrades: The Power Macintosh Upgrade Card, which works in a IIvx, IIvi, Performa 600, and all Centrises and Quadras but the AV models, costs $699. A motherboard replacement that changes a Centris or Quadra 610 or 660AV to a Power Macintosh 6100/60 costs $999 (to a 6100/60AV, $1399); to change a IIvx, Centris 650, or Quadra 650 to a 7100/66 costs $1499 (to a 7100/66AV, $1699); and to change a Quadra 800 or 840AV to a 8100/80 costs $1899 (to a 8100/80AV, $1999). A 256K cache card for the 6100 and 7100 costs $299. Apple, 408/996-1010.

- DayStar Digital has decided not to offer PowerPC accelerators for the Mac II, IIx, or Mac IIcx, saying the market is too limited. DayStar, 404/967-2077.
- Microsoft plans to ship Excel, FoxPro, Word, Works, and PowerPoint for Power Macs by summer. Upgrades are free for owners of 680X0 versions bought after March 31, 1994. Microsoft, 206/882-8080.
- Adobe Systems has new versions of Illustrator and Premiere for PowerPC and 680X0 Macs. Adobe, 415/961-4400.—GALEN GRUMAN

IT'S GONE. AND YOU DIDN'T BACK IT UP.

FACE IT. YOU NEED to back up your files. Use Retrospect, the number one Macintosh backup software — backing up over one million Macs, at last count.

Dragging important files to floppy disks is not backing up. If you crash you'll be retyping and trying to recover files for days. And then still searching for what's missing months later. And what if there's a fire, theft, flood, or equipment breakdown?

dantz

With Retrospect from Dantz you'll be backing up to the storage device of your choice in seconds — including SyQuest, Optical, Bernoulli, floppies, and file servers. And just about any Macintosh tape drive you choose.

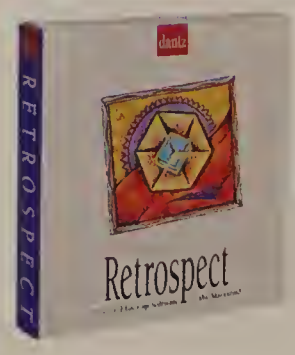


Retrospect packs more power than all the others put together.

AUTOMATIC OPERATION. Simply point and click to create a script, then schedule it to run days, nights, or weekends.

WORLD CLASS RESTORING. Every preference file, document, application, control panel, extension and font is returned to its exact location. You won't miss a beat.

SECURITY. Retrospect has security covered, with full password protection at every entry point. Even encrypt data passed over the network to prevent snooping.



SPEED. Retrospect's customized drivers and interleaved data flow operate SCSI storage devices 20%-100% faster than any other backup software — guaranteed.

Accelerated for Power Macintosh

COMPRESSION. Retrospect's built-in Lessr™ compression cuts backups down to size without compromising performance.

NETWORK OPERATION. Back up a network of Macintoshes as easily as you back up one. Just install a Remote INIT (available in Remote 10- or 50-Packs) on each of your networked Macintoshes and include them in your backup scripts.



TOP INDUSTRY AWARDS. Don't just take our word for it. Listen to what experts say about Retrospect: "Retrospect has no equal." *MacWeek*, Diamond Award. "For backing up and archiving, there's nothing better." *Macworld*. And Retrospect Remote is a *MacUser* 1993 Editor's Choice Award winner.

The price for peace of mind? Well under $200 — backed by a 30 day money back guarantee. Don't be caught off guard when disaster strikes, call your local dealer today.

Dantz Development Corp., 4 Orinda Way, Building C, Orinda CA 94563 (510)253-3000.

© 1994 Dantz Development Corp. Retrospect and Lessr are trademarks of Dantz Development Corp. Macintosh is a registered trademark, and Power Macintosh is a trademark, of Apple Computer, Inc. used under license.

Circle 26 on reader service card

New Products

THE LATEST MACINTOSH RELEASES

by Cameron Crotty

THIS SECTION COVERS MACINTOSH PRODUCTS FORMALLY ANNOUNCED BUT NOT YET EVALUATED BY *MACWORLD*. UNLESS OTHERWISE STATED, THE MINIMUM REQUIREMENTS FOR OPERATION ARE A MAC PLUS, WITH 1MB OF RAM, RUNNING SYSTEM 6. ALL INFORMATION AND PERFORMANCE CLAIMS ARE SUPPLIED BY THE PRODUCT VENDOR AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY *MACWORLD*. ALL PRICES ARE SUGGESTED RETAIL. PLEASE CALL VENDORS FOR INFORMATION ON AVAILABILITY.

HARDWARE

LaserLeader Mark 9315 and 9320

These workgroup printers can print up to 400 by 400 dpi on 11-by-17-inch paper and are designed to exist in multiple-protocol network environments. Both support PostScript, HPGL, HPGL/2, and HP PCL-4, and can be connected via EtherTalk, DECnet, Token Ring, LocalTalk, Novell NetWare, Banyan VINES, and TCP/IP. The printer comes with five open interface slots—you tell the company how you want the printer configured (Ethernet and Token Ring interfaces cost extra). All ports are simultaneously active, and the print controller automatically senses and switches emulations. The printers ship with 32MB of RAM



LaserLeader Mark 9320

(which is expandable to 64MB); a 1.44MB floppy drive; and an internal 85MB hard drive with 35 PostScript and 27 HP PCL fonts loaded. The Mark 9315 prints at 15 ppm, while the 9320 goes up to 20 ppm. A three-tray option is available for both printers. 9315 $4795; 9320 $5375; Ethernet interface cards $395; Token Ring interface cards $995. BGL Technology Corp., 805/987-7305; fax 805/ 987-7346.

LitePro 540

Geared toward the presentation of graphics and animation, this 19-pound color projector uses an active matrix LCD that can display 1.4 million colors simultaneously from a palette of 16.7 million colors. The device can project a 15-foot diagonal image of a 640-by-480-pixel image. The projector plugs into the video-out port of any Macintosh, and an included remote control can be used to adjust display parameters (for example, brightness, contrast, hue). $7499. In Focus Systems, 503/692-4968, 800/294-6400; fax 503/692-4476.



LitePro 540

Mac Imagination Pak

CD-I developers, take note. The Imagination Pak is based on a NuBus card that allows Macs to recognize and play back CD-I discs from a regular CD-ROM drive. The Authors version of the Pak includes the MediaMogul 2.0 multimedia authoring package for nonprogramming producers, as well as script2disc 2.0. A Studio version adds CD-I plug-ins for Adobe Photoshop, Color It 3.0 from MicroFrontier, and Equilibrium Technologies' DeBabelizer. Authors Pak $16,000; Studio Pak $18,500. OptImage, 515/225-7000, 800/234-5484; fax 515/225-0252.

MK/5

Don't have space on your desktop for one more disk array? Then put that baby in a rack. Mega Drive Systems' latest line of arrays support RAID levels 0, 3, and 5; come with a SCSI-2 Fast/Wide interface; and are rack mountable. The systems feature an LCD configuration-panel that covers drive, power supply, fan, and component status. Users can execute built-in diagnostics or reconstruct drives on the fly from the panel. MK/5 owners must use the company's Mercury line of pluggable hard drives. 10GB $22,700. Mega Drive Systems, 310/247-0006; 800/322-4744, ext. 400; fax 310/247-8118.

Olympus 128MO Macintosh

Based on Olympus's own mechanism, this external, SCSI magneto-optical drive stores up to 128MB on standard 3.5-inch MO disks. The drive features an average seek time of less than 38ms, and a data-transfer rate of up to 768MB per second. The drive ships with Formatter-One Pro formatting and driver software by Software Architects, and the package supports Apple's SCSI Manager 4.3. $1195. Olympus, 714/753-5935, 800/347-4027; fax 714/453-4468.

PanelBook 530

At 9.5 by 11.5 by 2 inches, this portable color LCD projection panel is small enough to take nearly anywhere there's an overhead projector. The 8.5-inch-diagonal active matrix screen can simultaneously project 1.4 million colors (from a palette of 16.7 million) at 640-by-480-pixel resolution. The panel comes with built-in NTSC and PAL jacks for displaying composite video, and it connects to the video-out port of any Mac. $5299. In Focus Systems, 503/692-4968, 800/294-6400; fax 503/692-4476.

Power Array

For those with modest array requirements, this enclosure has only two drive slots. The product has a SCSI-2 Fast/Wide interface, and supports RAID levels 0, 1, and 5. As with other Mega Drive arrays, customers must use the company's Mercury line of removable hard drive modules. Drive modules can be key locked for additional security. 1GB $2899. Mega Drive Systems, 310/247-0006; 800/322-4744, ext. 400; fax 310/247-8118.



Power Array

SC-726MXL and SC-726UXL

Don't let the beguiling names fool you—these 17-inch color monitors feature a .26mm dot pitch and digital controls, are MPR-II– and Energy Star–compliant, and sync to multiple signals at resolutions



SC-726MXL

up to 1280 by 1024 pixels. The UXL produces vertical refresh rates of up to 60Hz, while the MXL goes up to 72Hz; both come with tilt-and-swivel stands. SC-726UXL $959; SC-726MXL $1099. Samtron Displays, 310/802-8425, 800/726-8766; fax 310/802-8820.

SledgeHammer Wide and SledgeHammer II

When your data absolutely, positively had to be there five seconds ago, disk arrays can give you the speed you need. Products in FWB's SledgeHammer Wide family ship with an external array enclosure, a SCSI JackHammer (the company's NuBus SCSI-2 board), RAID ToolKit software, and cables. The SledgeHammer II line adds a second SCSI-2 card to the package. Depending on how the arrays are configured, average effective seek times range from 4.25ms to 4.75ms, and users can expect sustained data-transfer rates ranging from 8.1 MBps up to 11.5 MBps. SledgeHammer 2000-Wide (2GB) $4129; SledgeHammer 2000-II (2GB) $4729. FWB, 415/474-8055; fax 415/775-2125.

Vista Printing System

A large-format, 300-dpi PostScript color ink-jet printer and raster image processor (RIP). The product can print CMYK images up to 36 inches wide by 18.2 feet long on a variety of materials. The RIP server functions as a print server and spooler, and users can preview a job, adjust scaling and rotation, and monitor use of ink and materials, all from the server display or a remote location. The Vista System supports EFI's EFIColor Color Matching System, and supports EtherTalk and LocalTalk (autosensing). $19,995. NewGen Systems Corp., 714/641-8600, 800/756-0556; fax 714/641-2800.

continues

SOFTWARE

AccuPrompt

Television personalities should never be at a loss for words, and this teleprompting software can help keep them speaking smoothly. Users can import formatted files from several popular word processors (via Claris's XTND technology), queue them up in the order they're to be read, and edit them with a built-in word processor. Dynamic sliding time scales display elapsed and remaining time for both the current script and any that are on deck. The software can also turn the text display upside down for use with a camera or podium-mounted monitor. Requires System 7, Mac II. $3990. Questar Systems, 404/956-0700; fax 404/956-8781.

Afrocentric Klips Sampler Library 1

Culturally specific clip art featuring African-Americans in business, at church, and at home. Includes black-and-white and color illustrations in EPS, PCX, and TIFF formats. Topics include Children, Black Church, Brothers, Black Families, Occupations, Kenté patterns, Health, Sisters, and Couples. $79. Afrocentrex, 312/463-6269; no fax.

Animation:Master

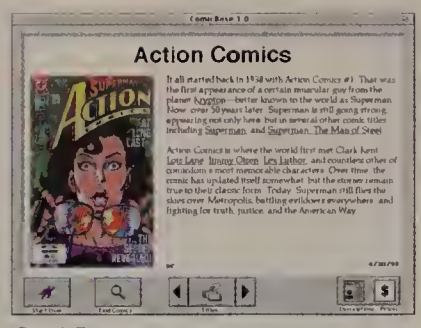
A rendering-and-animation package based on Will Vinton's Playmation. The modeling interface is spline-based, and the package features channel-based motion for more realism than is traditionally available to animators, according to the manufacturer. Users can create custom textures and materials and animate them along with the object they're applied to. Also, hierarchical model segments may be smoothly joined with the Skin command, and images may be loaded for rotoscoping or for use as modeling templates. 5MB min. memory; requires Mac II, FPU. $1059. Hash, 206/750-0042; fax 206/750-0451.



Animation:Master

ComicBase

Leapin' lizards! This comic book encyclopedia and database includes color illustrations and information on nearly 300 titles in all genres from romance to war comics to superheroes. Market and appraisal information for the last four years are included, and you can create inventory reports, reports of the total value of your collection, plus checklists of issues needed to complete your collection. Selected words and titles are hypertext-linked to one another, so if you're reading about Thor appearing in an issue of *Spider Man,* you can click on Thor's name and go straight to his entry. A read-only Comic Show feature allows visitors to browse through your collection without making changes. Requires Mac SE. $149. Human Computing, 408/774-9016; fax 408/774-9016.



ComicBase

Cron Manager

Let's say that every day at 4 p.m. you update the chart you're keeping on the number of trips you make to the coffee machine. When you place this control panel in your System Folder and restart, it creates a Cron Events folder, and any file placed within that folder opens at the date and time specified in its name. You can tell a file (folder, document, or application) to open once at a specific date and time, or you can create recurring events: each day at a specific time, Cron Manager opens an appropriately named document. Requires System 7. $26.95. Orchard Software, 617/876-4608; no fax.

Doodle-mation

You mean you're still doodling with a pencil and paper? How low-tech. After you choose a set of shapes and lines, set their behavior controls, and click on Go, they fly around your screen, leaving trails, growing, shrinking, bouncing, and interacting with each other. You can change shapes' patterns as they fly, assign sounds to patterns and events, cycle the colors, and save your favorite patterns and animations as After Dark screen-saver modules. You can even doodle on your screen saver while it's running. 2MB min. memory; requires Berkeley Systems' After Dark to display screen saver. $29.95. Screen Magic, 415/648-8056, 800/336-2947; fax 415/647-2448.

Fast Pitch Pro

A HyperCard XCMD that lets users make multimedia presentations and control them (forward and reverse) with a single mouse-click. Presentations can include any combination of text, color paint, sound, pictures, QuickTime movies, laser disc media (with Videodisc plug-in sold separately), and audio CD media (with Pro AudioCD plug-in sold separately). This XCMD includes a run-time option so that users can create stand-alone slide stacks. Requires HyperCard 1.1 or HyperPlayer. $79.95. Objectic Systems, 317/898-4017, 800/859-9543; fax 317/898-4017.

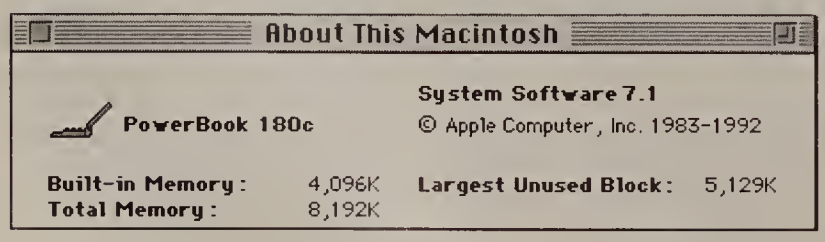
Icon Mania

It may be hip to have a customized desktop, but tweaking those tiny icons can be less than rewarding. This application helps users create and apply icons to both folders and files in several ways. For instance, users can drag a graphics

continues

Double your RAM.

Just install RAM Doubler™ software in your Mac and it doubles your RAM. It's that easy. No more hassles, just more RAM.



RAM Doubler is an extension that works by reclaiming memory not being used. MacWEEK says "RAM Doubler couldn't be easier to use." It is the latest from Connectix, the Macintosh memory experts and makers of the award-winning CPU and MODE32.

RAM Doubler is affordable at $99 SRP with a 30-day money back guarantee. Get RAM Doubler wherever great software is sold.



CONNECTIX

800-950-5880 ext. 37

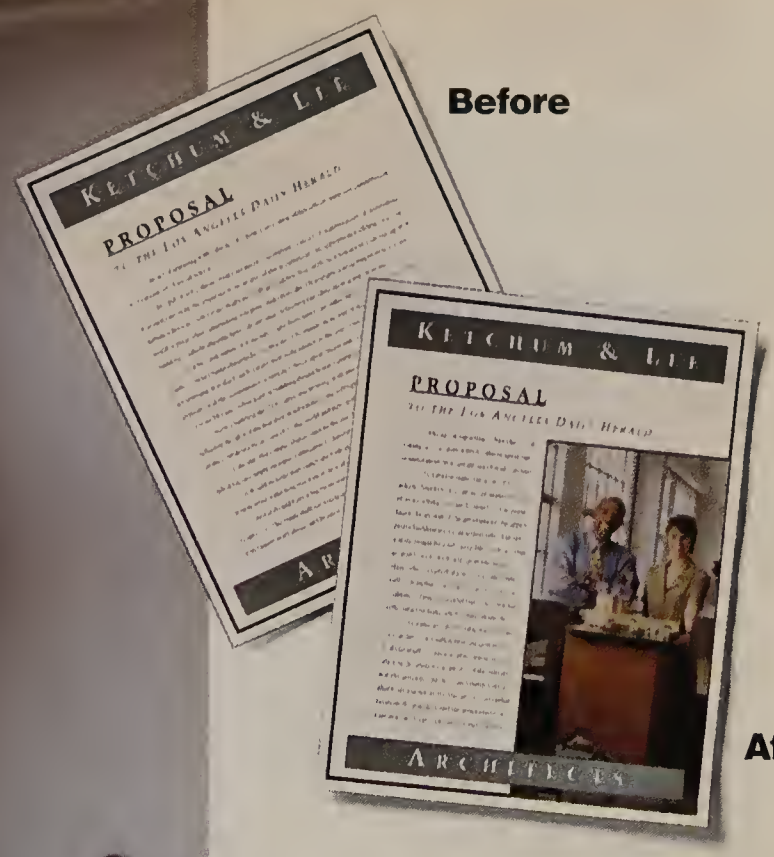
or 415-571-5100, fax 415-571-5195

MACWORLD MW EDITORS' CHOICE

©1994 Connectix Corporation. RAM Doubler requires Mac II (with PMMU) or better (68030 or 68040 processor) with 4 MB RAM & System 6 or 7. RAM Doubler is not compatible with Mac LC, Classic, Plus, SE or PowerBook 100. RAM Doubler, CPU and MODE32 are trademarks of Connectix. All other trademarks are the property of their respective holders.

PowerMac Version Available Soon!

Circle 189 on reader service card



It makes everything you do look better than before.

Point, shoot, plug it into your computer. With Apple digital photography, you're minutes away from a more credible credentials presentation, a report that feels important or a staff memo that sings. No film. No waiting. You get great 24-bit color images in next to no time.

The Apple® QuickTake™ 100 digital camera comes with everything you need. It only weighs a pound. And at $749,* just about any business can build a case for one. To locate your authorized Apple reseller, call 800-732-3131, ext. 550. And add a new dimension to your work.

The New Apple QuickTake 100 Digital Camera



*Apple Price as of 3/1/94. Actual retail prices may vary depending on location. ©1994 Apple Computer, Inc. All rights reserved. Apple and the Apple logo are registered trademarks of Apple Computer, Inc. QuickTake is a trademark of Apple Computer, Inc.

file onto the application, and Icon Mania changes the file's icon to a thumbnail of the graphic in the file. Icon Mania can also create custom folder and button icons based on any other icon. A color icon editor is also included, as is a library of over 800 icons. Requires System 7, color. $69.95. Dubl-Click Software, 818/888-2068, 800/266-9525; fax 818/888-5405.

MacSpeakerz 3.0

The latest version of this loudspeaker-design application can analyze six different box types as well as Isobarik variations on each of these. Specifically, the software can now analyze third-order closed-box types, as well as fourth-, fifth-, and sixth-order band-pass box types. MacSpeakerz suggests enclosure volumes and tunings for each box type, and the manual currently includes a tutorial for those who are new to speaker design. $299. True Image Audio, 619/480-8961, 800/621-4411; fax 619/480-8961.

MasterCook II

In addition to containing more than 1000 recipes, this software has nutritional information ranging from fat content to sodium level on every ingredient in its database. Users can search for foods or recipes based on several criteria, including ingredients, nutritional information, and time needed to prepare a dish. Users can recalculate recipes to feed up to 999 people, and can generate menus or diet plans with four meals a day for up to 31 days. MasterCook software also generates shopping lists. $29.95. Arion Software, 512/327-9573, 800/444-8104; fax 512/327-3786.

MicroExpressionist

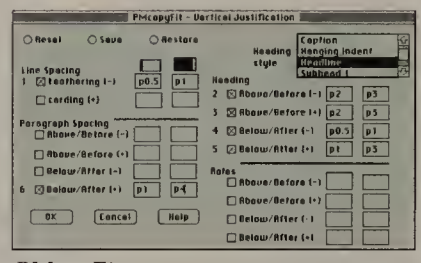
Designed for users who need math equations in their documents but don't need a full-blown equation editor, this package is a slimmed-down version of Prescience's Expressionist. The smaller package features simplified palette and menu choices; and it lets users cut and paste equations directly into word processing, page-layout, or presentation software. $79. Prescience Corp., 415/543-2252, 800/827-6284; fax 415/882-0530.

The Multimedia Workshop

Here are some tools for the younger generation—this three-part package lets kids create and edit multimedia presentations encompassing text, still images, audio, and video. In the Writing Workshop, kids plan, lay out, edit, and print traditional text and graphics documents; optionally, the Mac can read all text aloud. The Video Workshop has basic video-editing tools: users select a background and a video clip, add narration, and assemble their clips in the Sequencer. Finally, the Paint Workshop is for creating illustrations or customizing photos or clip art. Libraries of photos, sound effects, music, QuickTime movies, and clip art are also included. 4MB min. memory; requires Mac LC, System 7. $79.95. Davidson & Associates, 310/793-0600, 800/545-7677; fax 310/793-0601.

PMcopyFit

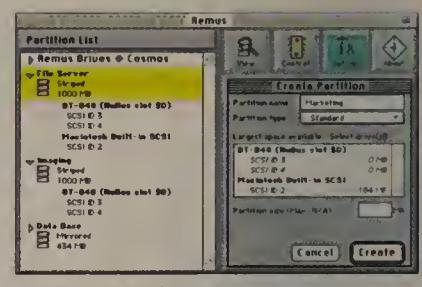
Instant, automatic, vertical copyfitting from within PageMaker can be yours with this PageMaker Addition. You set justification points between text lines, above and below heads (multiple heads are respected), above and below paragraphs, and above and below horizontal rules. Once you've got it just the way you want it (including the order of precedence for these operations), you select the text you want to justify, sit back, and let your Mac do the dirty work. Requires PageMaker 5.0. $99. EDCO Services, 813/962-7800, 800/523-8973; fax 813/960-2356.



PMcopyFit

Pop-In Parts

Clip art features components that are found in technical illustrations. Volume 1 contains rings, springs, pins, and threaded fasteners. Volume 2 contains meters, lights, numerical displays, switches, knobs, electrical plugs, cables and sockets, and cooling-fan grilles. Both volumes have several two-dimensional and three-dimensional views of each object, and illustrations are in EPS format. $49 per volume. Tech-M, 813/ 576-1884; fax 813/577-7207.



Remus Limited

Remus Limited

A stripped-down version of Trillium Research's RAID software, this package supports RAID levels 0 and 1 over the Macintosh's built-in SCSI port or SCSI controllers from Atto, BusLogic, FWB, and others. Formatting and partitioning software is included, and the package alerts the user to failures via alert windows, sounds, and network messages. Remus Limited can also report to some network troubleshooting notification systems, including Caravelle's Networks. 4MB min. memory; requires Mac II, System 7. $295. Trillium Research, 715/381-1900; fax 715/381-1901.

Scenery Animator

Using data from the U.S. Geological Survey, this software renders 3-D landscape scenes both real and imagined. Visit Yosemite, the Grand Canyon, Hawaii, Mount Saint Helens, and a lunar landscape—other landscape models are also available. Users can create pictures from any perspective, or draw a flight path for animation. Light levels, landscape color, cloud levels, and snow level are all

continues

GET READY TO EXPLODE, SHATTER AND ATOMIZE

STRATA™ STUDIO Pro

Now you can create sizzling Hollywood-style movies on your Mac! The exclusive special effects Explode, Shatter and Atomize are only one part of Strata StudioPro's incredible power. It offers fully integrated advanced spline-based modeling, award-winning rendering technology, and a sophisticated Event-Based Animation System; putting StudioPro in a class by itself. Along with these powerful features, StudioPro's graphical interface and dialogues are easy to use, making it a breeze to create stunning 3-D designs aod animation's. If you're looking for professional 3-D tools you've found them in StudioPro. Call now to order StudioPro.

1-800-869-6855

Strata, Inc. • 2 West St. George Blvd., Suite 2100 • St. George, Utah 84770 • (801) 628-5218

MACWORLD MW ★★★★

STRATA

Circle 114 on reader service card





Before

After

It makes everything you do look better than before.

Point. Shoot. Plug it into your computer. There's no faster way than Apple digital photography to make a flyer really fly. No film. No waiting. In minutes, you have vivid 24-bit color pictures that can help you promote anything from a big idea to a big sale.

The Apple® QuickTake™ 100 digital camera holds up to 32 photos. It comes with everything you need. And at $749*, it actually costs less than comparable digital cameras. For an authorized Apple reseller, call 800-732-3131, ext. 550. And start showing off your company's best side.

The New Apple QuickTake 100 Digital Camera



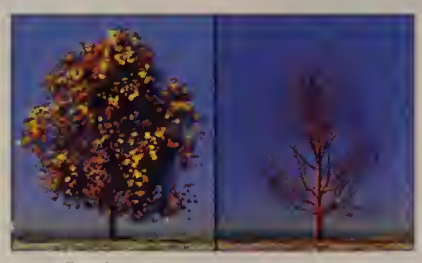
Apple Price as of 3/1/94. Actual retail prices may vary depending on location. *©1994 Apple Computer, Inc. All rights reserved. Apple and the Apple logo are registered trademarks of Apple Computer, Inc. QuickTake is a trademark of Apple Computer, Inc.*

adjustable, and scenes may optionally include trees and lakes. Landscapes may be saved as PICT or TIFF files in up to 24-bit color, and animations may be saved as QuickTime, PICS, or separate PICT files. 4MB min. memory; requires 8-bit color. $149. Natural Graphics, 916/624-1436; fax 916/624-1406.

Spreadware Statistics Menu
Once this Excel add-in is installed, all you have to do is select the cells containing your data, choose the statistical calculation you wish to perform on it, and then pick a cell where you want the output. Version 3 of Statistics Menu features new nonparametric routines including Dunn's multiple comparisons, Kruskal-Wallis one-way ANOVA, and several chi-square routines. All routines are also available through Excel's macro language. Requires Microsoft Excel 4.0. $129. Spreadware, 619/347-2365; fax 619/347-6045.

Sword of Sodan
Talk about a job for Superman—you must avenge the death of your father, the king, and free the cities of the Northern Kingdom from the tyrannical reign of Zoras the evil. This fantasy role-playing game comes with castles and dungeons, vile creatures, and all manner of magical items. Can you survive Castle Graggamore long enough to unseat the foul fiend that holds your land in thrall? 4MB min. memory; requires System 7, Mac II, 256 colors. $49.95. Bethesda Softworks, 301/926-8300, 800/677-0700; fax 301/926-8010.

Tree Professional
If only creating trees were as simple as modeling them on your Mac. This software models and renders trees, which you can then save as PICT or DXF files.



Tree Professional

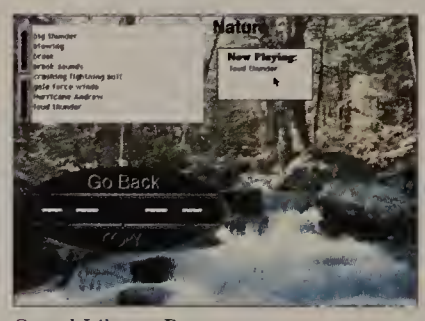
You can model both broadleaf and conifer trees as well as adjust dozens of parameters, including trunk structure and color, bough structure and color, branch winding, leaf population, and crown spread. A 2-D–only version of the software is also available, as is a library of 33 broadleaf and 17 conifer trees, saved as Tree Professional parameters. 4MB min. memory; requires Mac II, FPU, 8-bit color, 13-inch monitor. Tree Professional $695; Tree 2-D $149; Tree Library $129. Onyx Computing, 617/876-3876; fax 617/868-8033.

CD-ROMS

Mac Cocktail 1.5
The drinks are on your Mac with this disc of over 200 contemporary and traditional cocktail recipes. Each drink is pictured alongside a list of ingredients, with instructions and tips for mixing them. Basic mixology and garnish practices are illustrated with QuickTime movies. Users can search for drinks by name or by ingredients, and the disc includes a primer on the history and usage of common spirits. Users can also edit drink recipes and add their own drinks. $79.95. Blackfire, 310/798-0202, 800/556-7207; fax 310/379-1182.

PowerTools
Just got to have shareware, but you don't have a modem to download it? This disc offers over 5000 pieces of shareware, freeware, and public domain software in 15 categories, including Applications, Arts & Graphics, Business, Communication, and Utilities. The disc ships with a browser to fleetly ferret out files. $79.95. Softbit, 714/251-8600; fax 714/261-7977.

Sound Library Pro
More than 1200 digitally recorded sounds in six main categories: Animals, Household, Instruments, Nature, Special Effects, and Voice. Each sound comes in 22kHz and 11kHz versions (both 8-bit mono), and all sounds are supplied without extensive copyright restrictions. A MacroMind Director–based navigator is included. $49. Wayzata Technology, 218/326-0597, 800/735-7321; fax 218/326-0598.



Sound Library Pro

ACCESSORIES

KeyStone
Jealous of how many keyboard/mouse/trackball devices PC users have to choose from (and how little they cost)? This box plugs into your Mac's ADB port and provides a 5-pin PC-AT–compatible keyboard port, a 9-pin PC-mouse port, a pass-through ADB port, and a power-on switch for Macs. Included control panel software lets you assign actions to three-button mice, control mouse tracking and click speed, and remap your ⌘ and option keys to equivalent keys on the new keyboard. The unit draws its power from the ADB port, but it cannot be used with a PowerBook. $99. Silicon Valley Bus Company, 408/623-2300, 800/775-0555; fax 408/623-4440.

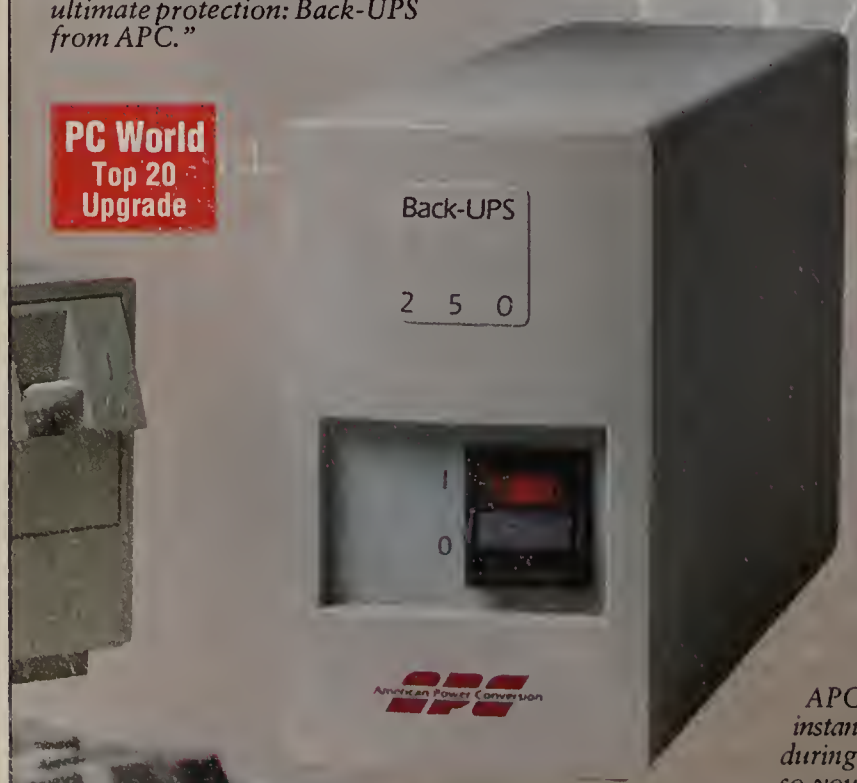
PocketNet 2001
Being able to plug into a LocalTalk network or a phone line can be twice as important while you're on the road, but you consider yourself lucky if it's only twice as difficult. This kit includes a modem/network phone cable on a retractable coil; an adapter that plugs into most common home, business, and

continues

Introducing the $139 investment no Mac user can afford to be without...

"Don't take chances...Get the ultimate protection: Back-UPS from APC."

PC World Top 20 Upgrade



Blackouts, brownouts, sags... if you use computers, your bottom line is directly linked to your power line. The fact is, your data and hardware are vulnerable to problems that surge suppressors and power directors just aren't equipped to handle.

Call for your FREE 60 page PC power protection handbook!

Now there's an Uninterruptible Power Supply (UPS) to suit any budget. Back-UPS® are perfect protection for LAN servers, personal computers, phone/fax systems, POS equipment, or any other device that can go down when the power does. If lightning is a concern, Back-UPS are even backed by a $25,000 insurance policy against surge damage to your equipment (see details).

So don't wait for the inevitable power problem to rob your business. Protect your productivity with Back-UPS, available where quality computer products are sold.

APC Back-UPS provide instantaneous battery power during power disturbances, so your data and hardware are safe!

APC™
AMERICAN POWER CONVERSION
800-800-4APC, dept. D7

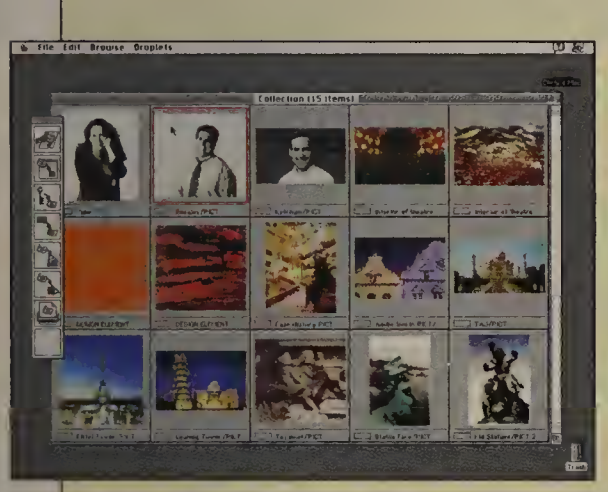
Local phone and fax for: **Germany** - Fax: 089.950.51.66, **United Kingdom** - Fax: 81.667.1947, **France** - NoVert: 05.09.24.07

© 1993 Trademarks are property of their respective owners. • Suggested list price.

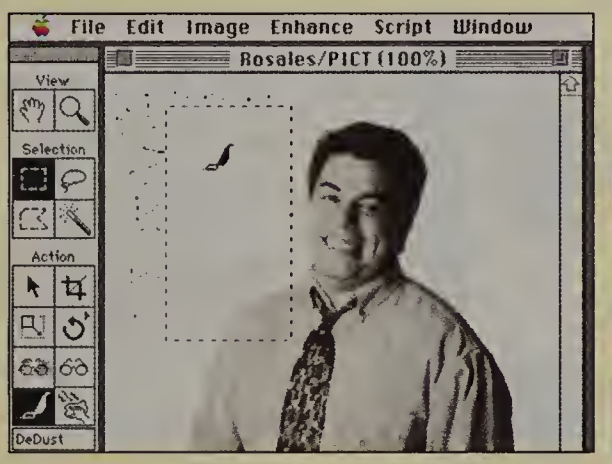
Circle 72 on reader service card

A simple demonstration of PhotoFlash software.

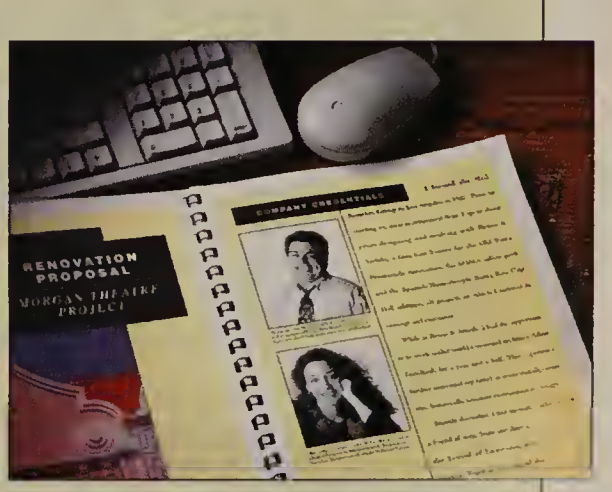
(A complicated demonstration isn't possible.)



1. Find a photo. *The PhotoFlash Browser makes it easy to view and pick a photo — they're all stored here, whether you got them from a CD, scanner or digital camera.*



2. Enhance it. *Crop, rotate and resize a picture with easy-to-use tools. Dust and scratch removal is automated, too. You can instantly preview adjustments you've made.*



3. Place it. *With a point and click, PhotoFlash automatically places the picture in your work. You can also record and automate the tasks you do most often.*

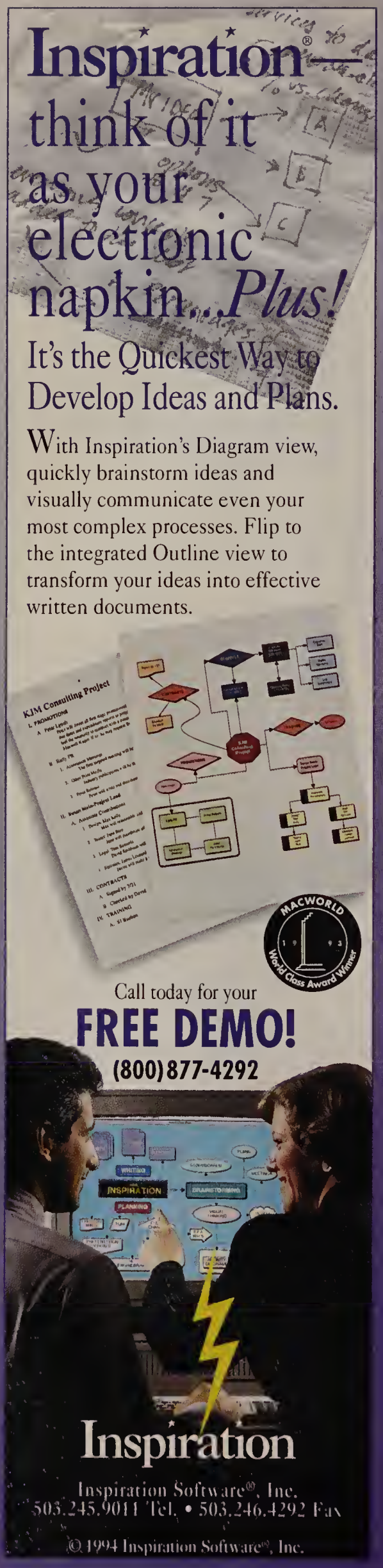


You used to have to spend a lot — and then learn a lot — before you could work with photos on your computer. Now there's PhotoFlash™ software from Apple.

PhotoFlash is easy to use. It helps you organize pictures, enhance them and drop them into your work. It's fast (screamingly fast on a Power Macintosh™). It's memory efficient. And it's just $279.* Call 800-538-9696 to locate your authorized Apple reseller. You'll get the picture right away.

Apple

*Manufacturer's suggested retail price as of 1/15/94. © 1994 Apple Computer Inc. All rights reserved. Apple and the Apple logo are registered trademarks and PhotoFlash and Power Macintosh are trademarks of Apple Computer Inc.



New Products

hotel (analog) telephone systems; two PhoneNet connectors; and a mini How To Connect guide. A modem-only version (PocketNet 2000) is available sans PhoneNet connectors. The retractable cable is available alone as the PocketNet 2002. PocketNet 2001 $59.95; 2000 $29.95; 2002 $19.95. Pilot Technologies, 612/828-6002, 800/682-4987; fax 612/828-6806.

Rolling Colors Trackballs

The only problem with PowerBooks is that they're so lifeless—so completely without personality. Fortunately, you can spice up your boring PowerBook with a brightly colored trackball. The 30mm Rolling Colors Trackballs fit most non-Duo PowerBooks (models 140 through185c), and you get three of them: one green, one yellow, and one magenta. $14.95. CoStar Corp., 203/661-9700, 800/426-7827; fax 203/661-1540.



SunPack PB

SunPack PB

A sunny day at the beach—just perfect for catching up on a little work on your PowerBook, right? It is if you're using this pair of solar panels for power. Together the panels measure 23 by 16.5 inches (11.5 by 16.5 folded for storage), and they provide enough juice to run a standard PowerBook in full sunlight. In less than full sunlight, the SunPack can still charge the battery. The panels connect to the PowerBook with a 6-foot power cord. $229. Keep It Simple Software, 406/442-3559, 800/327-6882; fax 406/442-1316.

BOOKS

The Macintosh 3-D Workshop

For beginning to intermediate users who want to learn more about 3-D software and techniques, this book comes with a CD-ROM with try-out versions of Infini-D, Adobe Dimensions, formZ, Life Forms, MacroModel, ModelShop II, and Swivel 3D Professional. Author Sean Wagstaff covers 50 Mac 3-D–imaging software packages with examples of how the packages can work both separately and together. 485 pages. $39.95. Hayden Books, 317/ 581-3500, 800/ 428-5331; fax 317/ 581-3550.

The Macintosh Joker

There's one in every office. The one person who reads books like this to discover cruel tricks to play on his or her compatriots. Written by Owen Linzmayer, this book includes a disk with 33 control panels, extensions, and applications that do no harm to a victim's data or machine, but could cause extreme psychological trauma. By way of example, consider Mitten Touch-Typist, which randomly introduces errors as an unsuspecting user pecks away happily. 144 pages. $19.95. Hayden Books, 317/ 581-3500, 800/428-5331; fax 317/ 581-3550.

Net Guide

Presented in an A-to-Z reference format, this book contains over 4000 entries covering what's available online. Entries include recommendations of the best places to find or discuss a certain topic, cross-references to other topics, downloaded pictures, and money-saving tips. Written by Michael Wolff and Peter Rutten. 364 pages. $19. Random House Electronic Publishing, 212/572-2600, 800/733-3000; fax 800/659-2436.

The Official Print Shop Deluxe Handbook

The third edition of this source book contains full descriptions of Print Shop Deluxe's new features; hundreds of designs applicable to home, school, and business; a chapter on five easy steps to good design; examples of the program's graphics and fonts; and dozens of layout ideas and suggestions. Written by Randi Benton and Mary Schenck. 320 pages. $25. Random House Electronic Publishing, 212/572-2600, 800/733-3000; fax 800/659-2436.

The Online User's Encyclopedia: Bulletin Boards and Beyond

This comprehensive reference covers everything from the Internet to Bitnet to FidoNet. Readers can learn how to connect to global networks, and the book includes comprehensive listings of bul-

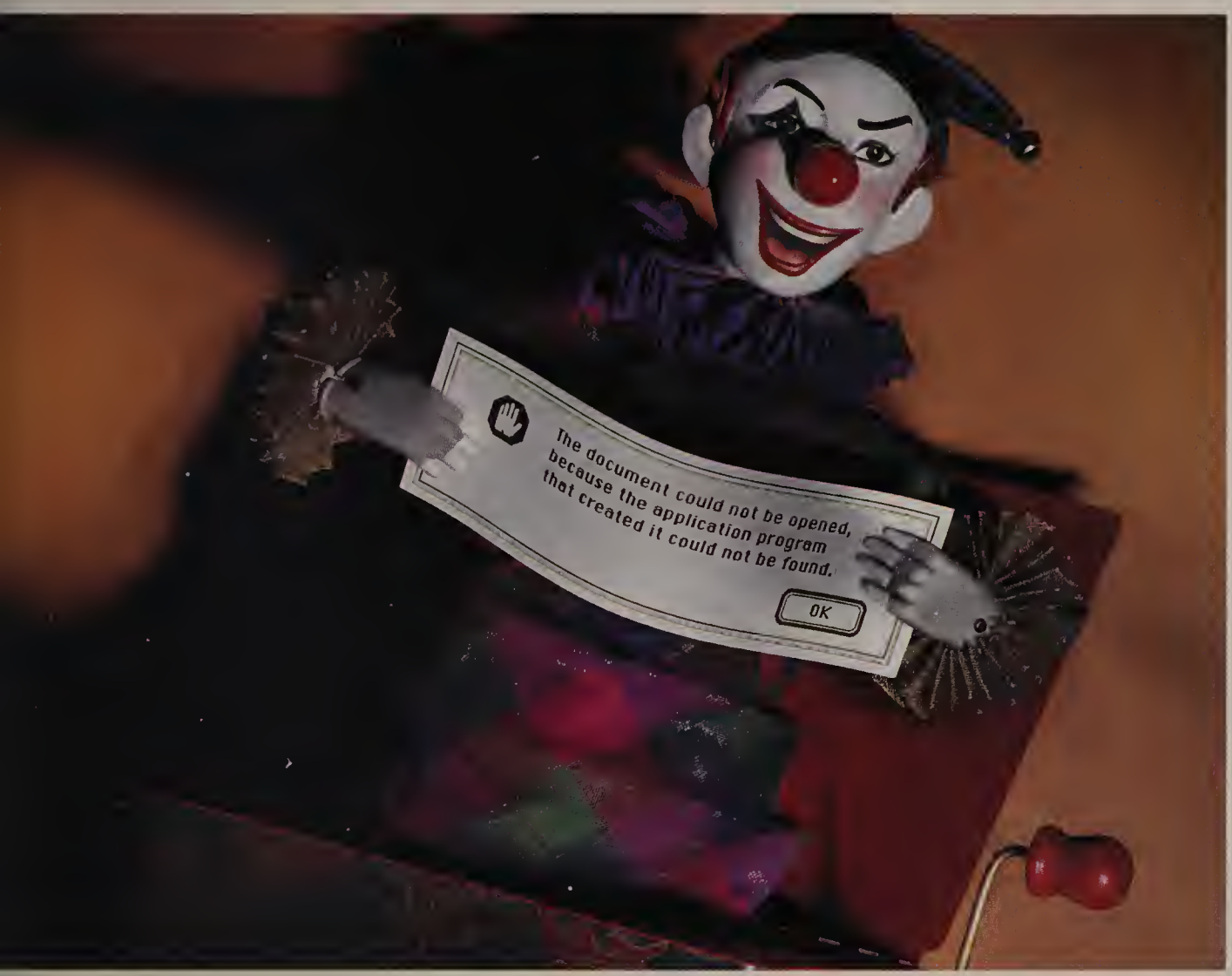


The Online User's Encyclopedia: Bulletin Boards and Beyond

letin boards and Internet service providers. Author Bernard Adobe also includes chapters on the UUCP, ILink, and PostLink networks. Plus he covers file transfer, conversion, and compression on Macs, PC compatibles, and Unix machines. 832 pages. $32.95. Addison-Wesley Publishing Co., 617/944-3700, 800/358-4566; fax 617/942-1621. m

To have your product considered for inclusion in *New Products*, send an announcement with product name, description, minimum memory, peripherals required, pricing, company name, and phone number to New Products Editor, *Macworld*, 501 Second St., San Francisco, CA 94107. *Macworld* reserves the right to edit all product announcements.

MacLinkPlus Prevents PC File Incompatibilities From Popping Up On Your Mac.



No More Surprises.

When you're trying to open DOS and Windows files on your Mac, the last thing you want is a big surprise. Now you can put an end to file incompatibility by simply installing MacLinkPlus.™ Our vast selection of translators and Macintosh® Easy Open let you open and edit almost any DOS or Windows file just by clicking on it. No fooling!



We Don't Make The Applications You Use. We Make Them Compatible.



With MacLinkPlus on your Macintosh, everyday applications are more compatible with the rest of the computing world. Use DOS and Windows files within Mac applications like Word, WordPerfect, ClarisWorks, SuperPaint, Excel and more. And if a PC user "pops up", you can turn Mac files into DOS or Windows files for them in seconds, all with original text formatting and graphics intact.

Choose The MacLinkPlus Solution That's Right For You.

Whether you share files via disk, by modem or over a network, there's a MacLinkPlus product that's right for you. They all include over 1000 translation combinations and Macintosh Easy Open. Some also contain Macintosh PC Exchange™ from Apple for accessing DOS disks, and a serial cable for PC connections. So quit clowning around with half-baked solutions. Get MacLinkPlus. And get the last laugh on file incompatibility.

Only MacLinkPlus Gives You The Complete Solution.

	Macintosh PC Exchange	DOS Mounter	Access PC	MacLinkPlus	Acrobat	Common Ground	Replica
Mounts DOS Disks	✓	✓	✓	✓*			
Can View/Print PC Files			✓	✓	✓†	✓†	✓†
Translates Word Processors			✓	✓			
Translates Graphics				✓			
Translates Spreadsheets				✓			
Translates Databases				✓			
Can Connect Mac to PC via Cable or Modem				✓			

* Includes Macintosh PC Exchange † File must be in special format, no editing capability.

Call 800-254-1116 For More Information.
Multi-packs and site licenses available.

DATAVIZ™
THE DATABRIDGE SPECIALISTS

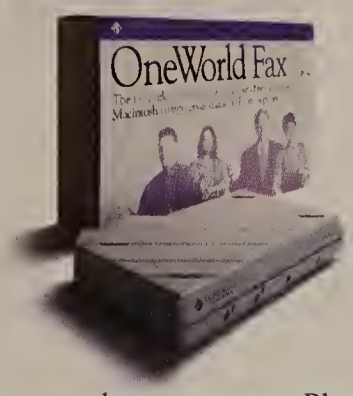
All product names are trademarks or registered trademarks of their respective holders. ©1994 DataViz, Inc. 55 Corporate Drive, Trumbull, CT 06611 (203) 268-0030 FAX (203) 268-4345

Circle 79 on reader service card





INTRODUCING OneWorld Fax NETWORK FAX SERVER



Talk about perception versus reality. Like something out of a science fiction movie, faxing came into being to move documents along at the speed of light. But in reality, "moving" hasn't been the activity most associated with faxing. "Waiting" has. Waiting for the document to print. Waiting in line. Waiting for the fax to go through. A situation where things can get so bottlenecked, an entire office can be reduced to a crawl.

Well, at Global Village Communication,™ we're happy to report a way to get everyone up to speed again.

And because OneWorld Fax sends faxes in the background over the network, you don't tie up your computer when faxing. You keep right on working.

You save money, too: Printing costs fall when you fax from your computer. Phone bills can be reduced since faxes can be scheduled to take advantage of off-peak phone rates. And, of course, you save valuable time.

And if all this news weren't good enough, OneWorld Fax is easy to install. Everything you need –all the hardware and software–is built into a single, self-configuring package smaller than a toaster. Anyone can install it, in a matter of minutes.

But, before you go, here's something else to consider: OneWorld Remote Access – a complete, easy-to-use ARA server for providing access to AppleTalk networks from remote Macintosh and PowerBook computers.

So. There you have it. Two ways to get everyone in your office up to speed again. Now isn't it time you got moving? For more information and for the Global Village dealer nearest you, call 1-800-736-4821, ext. 2246.

THE PROMISE OF FAX MACHINES IS TO HELP PEOPLE WORK AT A FASTER PACE. THEN, OF COURSE, THERE'S THE REALITY.

With something we call OneWorld™ Fax, the fax server that lets everyone on a network of Apple Macintosh computers fax right from their desk. With OneWorld Fax, everyone in the office can send faxes – to one person or to many – with just a few clicks of the mouse. It's as easy as printing, thanks to the industry-acclaimed GlobalFax™ software used in OneWorld Fax.

GLOBAL VILLAGE COMMUNICATION

Circle 156 on reader service card

©1994 Global Village Communication, Inc. Global Village Communication, the Global Village Communication logo, GlobalFax, and OneWorld are trademarks of Global Village Communication, Inc. AppleTalk® Remote Access is licensed from Apple Computer, Inc. All other brand names are trademarks of their respective companies. A special thank you to the snails who graciously lent their shells, and the Wee-Fit Clothing Outfitters for their ingenious turtleneck sweaters which kept the snails warm until their homes were returned

Reviews

Power Macintosh 6100/60

Macintosh Computer

PROS: Inexpensive; fast with native PowerPC software; built-in Ethernet; cache slot. **CONS:** Limited expansion. **COMPANY:** Apple Computer (408/996-1010). **COMPANY'S SUGGESTED PRICE:** Base model $1819.

MW ★★★★



STAN MUSILEK, SCREEN IMAGE BY ROGER RESSMEYER/STARLIGHT

THEY'RE FINALLY HERE. APPLE HAS released the long-awaited Power Macintoshes, with the initial emphasis on the 6100/60 model. The 6100/60—which looks like a Quadra 610 and has the widest initial availability—uses a 60MHz PowerPC 601 CPU, the first in a new series of chips to which Apple will migrate the entire Macintosh line over the next two years (see "The Power Macintosh Arrives," *Macworld*, May 1994).

Performance Breakthrough

Macworld Lab tests clearly show that, using native PowerPC software, the entry-level Power Mac 6100 surpasses the performance of a 60MHz Pentium 510–based PC, which had put even Apple's Quadra and 840AV to shame. Not only has Apple finally regained the performance lead it lost about eight years ago when PCs appeared using Intel's 80386 CPU, but it has pushed far ahead. The Power Mac 6100/60 with no cache is about 5 percent faster than a 60MHz Pentium PC (which includes a cache), and the 6100 is the slowest of the three new Power Macs.

But there's a big "but" about Power Mac performance: you need to have PowerPC software to get it. Using your existing 680X0 software, you'll get significantly less performance on a 6100, roughly equal to that of a IIci. This is not Apple's fault: it's up to developers to deliver PowerPC software, something that should start happening in great degree by fall. In the meantime, those who own 040-based Macs should wait until their key programs are available in PowerPC versions to switch; otherwise, they'll see a slowdown. Owners of 030-based Macs—except for IIfx and IIvx owners—have no reason to delay; their current programs will be a little faster on a Power Mac 6100.

Near-Perfect Compatibility

The Power Mac 6100 looks a lot like a Quadra 610 or Centris 610 for good reason: Apple decided that the Power Macs should be as compatible as possible with the previous lineup. Macworld Lab tested more than 100 programs and found that only a very few 680X0 programs don't work on a 6100. They include Kent Marsh's CryptoMactic, Kiwi Software's Power Menus, Connectix Corporation's RAM Doubler, and Jump Development Group's OptiMem—all work with low-level system software and hardware, making them the kind of program that will have incompatibilities with a new generation of Macintosh. Note that any 680X0 software that requires a math coprocessor won't work on a Power Mac; although the PowerPC has a built-in FPU, it's not compatible with the 680X0 CPUs' FPU.

Concerns over program compatibility should not dissuade you from getting a 6100. In fact, the degree of compatibility is better than what Apple achieved in its last three major transitions: first to 32-bit-clean systems, then to System 7, and finally to the 68040.

However, if you use accelerated video cards or similar INIT-enhanced hardware, you may lose some features. For example, accelerated 24-bit video cards need new INITs to run in accelerated mode, as well as to use some advanced features like on-the-fly resolution switching. SuperMac Technology and Radius have free INIT upgrades for current

products; SuperMac also provides new ROMs for free, while Radius charges a nominal fee. Other developers had not finalized their plans at press time, so check first.

What the 6100 Offers

Because of Apple's desire to make the Power Macintoshes look, feel, and behave like earlier Macs, the 6100 offers no revolutionary technology outside the PowerPC itself. But there are some differences, such as a video connector that's both old and new.

What's new is that the Power Mac has built-in resolution switching, so if you have a multisync monitor with the right kind of cable adapter (such as that in Apple's new 17- and 19-inch monitors or NEC Technologies' adapter for its current monitors), you can have the Mac expand or reduce the desktop view without restarting. Also new is a video port that doesn't use the standard Mac video connector; instead, it uses an AV-style connector. Apple includes an adapter cable so you can use existing Apple or multisync monitors.(The AV version of the 6100/60 includes a standard Mac-style video port as part of the AV card that goes into the 6100's PDS. You can use both ports simultaneously to connect two monitors.)

What's old is the return of RAM-based video—there's no video RAM in the 6100. That keeps Apple's costs down. However, the video display is about two-thirds the speed of a Quadra's VRAM-based video when using 680X0 programs. We didn't see this slowdown with beta PowerPC programs.

If you want more than 16-bit color depth for 14-inch monitors or 8-bit color for 16-inch monitors, you'll need to get a 7-inch video card and Apple's $99 PDS-to-NuBus adapter so you can connect the card to the 6100's Processor Direct Slot. Note that if you now have a Quadra or Centris 610, you cannot use its PDS-to-NuBus adapter. Also, if you have the 6100/60 AV, you can't add a video card because the AV card is installed in the sole expansion slot. Macworld Lab found that the AV card's video circuitry is only marginally faster than the circuitry for the back panel's port, so if you want AV capabilities as well as fast video, get a Power Mac 7100/66AV or 8100/80AV.

A less noticeable change to the 6100's bevy of ports is the use of GeoPorts for the serial (phone and modem) ports. The difference is that there's one extra hole in the port; current serial devices, such as fax modems, plug right in and run as always. The use of GeoPorts—coupled with Apple's bundling of the AV Macs' telephony, speech, and hi-fi stereo capabilities—should encourage developers to incorporate more AV technologies, such as software-based faxing through a GeoPort modem or phone pod. In fact, Apple bundles Express modem software to provide 9600-bps faxing through the GeoPort without a fax modem.

However, Apple engineers admit that some necessary operating-system extensions are needed to make telephony on the Mac a reality, and Apple's speech recognition still has a ways to go before it's practical. The real advantage of incorporating these AV technologies is the support for 16-bit audio.

Like all Power Macs, the 6100/60 includes an Ethernet port (you'll need a transceiver to connect to a network), a SCSI port, and a printer port. Apple offers models of the 6100 with CD-ROM drives (the type introduced in the Quadra 605 that has a built-in CD-ROM caddy). There's also a cache slot in which you can put a 256K cache SIMM—something that boosts performance by about 10 percent.

Goodies

Apple has added some interesting software onto the Power Macs' hard drive. One is a graphical calculator that does the kind of math you'd associate with rocket science—and it can even display the results graphically, which will make scientists and engineers happy. The Power Macs now also come with Macintosh PC Exchange 2.0, so your Mac can read PC drives (floppy drives, removables, and new to this version, hard drives), as well as AppleScript, so you can automate actions in programs like QuarkXPress that are scriptable. The AV version also comes with VideoFusion's VideoRecorder software, which lets you watch input from a TV or VCR in a window.

Good Deal

Apple says that a capable Power Mac 6100/60—with a CD-ROM drive, 8MB of RAM, and a 250MB hard drive—should go for about $2300, which is a great price. With a good multisync monitor, third-party extended keyboard, and another 4MB of RAM, you'll spend more like $3300 for a system that should give you power to spare for several years. (Not that you won't feel some envy when faster Macs appear, as they inevitably do every six to nine months or so.)

The 6100 is hard to resist, given its price and performance. The limited expansion won't affect most users, and those for whom it is an issue (mostly graphic artists and publishers) will want a faster Mac anyhow. When developers offer in PowerPC format the software that most business users run daily, it'll be time to get a Power Mac 6100/60.

—GALEN GRUMAN

MW LAB Power Macintosh 6100/60: How Fast Is It?

CORE-PERFORMANCE INDEX

Times as fast as a Classic (Classic = 1.0).

Use these standard ratings of overall performance, based on a core test suite, to compare systems across classes.

BUSINESS-SYSTEM PERFORMANCE TIMES

Times are in seconds. Shorter bars are better.

Use these results to compare the performance of systems for different types of real-world tasks within each class. For each type of system, results can be compared with other *Macworld* Business-System Performance Times.

Best result in test. Products are listed in increasing order of overall performance.

	Common	Scientific	Processor	Drive Access	Video Display	Floating Point
	Typical business tasks in Microsoft Excel and Word that use the Mac's processor, drives, and video display.	We added to the common tasks several scientific calculations (which use floating-point math).	Several tasks in Adobe Photoshop, Aldus FreeHand, Claris FileMaker Pro, and Microsoft Excel and Word.	File opens in Adobe Photoshop and disk-based sorts in Claris FileMaker Pro.	Horizontal and vertical scrolling in Microsoft Excel and Word, and QuarkXPress.	Scientific recalculations (which use floating-point math) in Microsoft Excel and 3-D rendering in Infini-D.
Power Mac 6100/60 [A]	5.6	5.7	365	73	114 [B]	343 [C]
IIci	4.9	9.2	467	111	173	53
Centris 610	8.8	9.0	201	64	77	108
Centris 650	12.8	21.8	162	60	64	24
Quadra 610	12.1	20.9	167	60	63	24
Quadra 840AV	16.5	28.8	118	59	49	18

[A] Using 680X0 programs, since PowerPC versions were not yet shipping for our test programs. [B] Using the AV card's video connector. [C] Could not perform Infini-D test because the 6100's 680X0 emulation includes no FPU, which Infini-D requires.

Macintosh LC 575

Macintosh Computer

PROS: Fast CPU; speedy 16-bit video; convenient, all-in-one cabinet. **CONS:** Limited expansion options. **COMPANY:** Apple Computer (408/996-1010). **COMPANY'S SUGGESTED PRICE:** $1699 with 5MB of RAM, 160MB hard drive, and internal CD-ROM player.

MW ★★★★

OK, LET'S MAKE A SHOPPING LIST. How about a Macintosh with a 33MHz 68040 CPU, built-in CD-ROM player (with a slide-out tray), 14-inch color monitor, 16-bit-color capability, a hard drive of at least 160MB, stereo speakers, and a microphone. Of course, a keyboard should be included in the box as well. And an upgrade path to Power Mac is also a must.

What's that, you only have about $1700 to spend? Before you hit that buzzer, let me tell you that there is indeed such a Macintosh out there, available through Apple's educational distribution channels as the LC 575. (There are also consumer versions, the Performa 575, 577, and 578. For more on these, see *MacBulletin*, in this issue.)

The LC 575, despite its larger size and hefty form (some 40 pounds' worth), should be considered a direct descendant of the original compact Macs, since it offers the same all-in-one solution.

The front of the LC 575 has a somewhat busy, high-tech appearance that I would label functional rather than attractive. At the top of the monitor is the microphone. The CD player is just beneath the monitor, on the left of the front faceplate. At the right is the floppy drive. The plastic grilles for the stereo loudspeakers occupy most of the recessed bottom portion of the faceplate. Controls for screen brightness and volume are situated between the speakers, along with a headphone jack and power-on light. The main power switch and the standard Macintosh connection ports are at the rear.

You can snap out the logic board by holding down two plastic tabs on the computer's back panel, then sliding out the board itself, making expansion simple. Unfortunately, other expansion opportunities are few. You can only add one 72-pin SIMM (it will address up to 36MB of RAM). There's a single PDS connector and a special 2-by-6-inch communications slot where you can add either an Ethernet card or a specially designed version of the Apple Express modem. There is no provision for NuBus expansion.



MARK JOHANN

Macintosh LC 575

The key expansion issue on the minds of many these days, though, is a Power Mac upgrade option. Apple has promised a Power Mac upgrade path for both the LC 575 and the LC 550 (which uses a 33MHz 68030 CPU), as well as other LC and Performa models later this year.

The internal CD-ROM player is the new Apple CD300 Plus, which is a multispeed, multisession drive with essentially the same performance specs as the older CD300 model. The biggest difference between the new design (which uses a Matsushita mechanism) and the previous model (which uses a Sony mechanism) is that those plastic CD caddies are history. The new player has a slide-out tray, just like an ordinary audio-CD player. It's a welcome change in my book.

The integrated monitor offers a bright, crisp, color picture, enhanced here by the internal video's 16-bit-color capability. The monitor is Energy Star–compliant, and a screen control panel can be set to power down the monitor after a preset interval. Clicking the mouse or pressing a key is all that's necessary to bring the screen to life.

Macworld Lab tests showed the LC 575 to be a brisk performer indeed. It is much faster than 68030 models and is clearly in Quadra territory, excepting the LC 575's inferior floating-point performance (it doesn't have an integrated FPU). Most Macintosh programs (excluding math and 3-D rendering) don't make FPU calls, so for most users, the lack of an FPU isn't a problem.

The integrated stereo speakers have a pleasant sound that's rather bass-shy—how about a bass-boost switch, Apple? The internal amplifier produces a reasonable volume, though it's far short of stereo levels.

The LC 575 (and its Performa equivalent) is an ideal choice for the student and for the small-business professional who wants high power and the convenience of having everything integrated into a single case. Even the power user in an office crowded with assorted Mac goodies might like having one of these around as a second computer. Either way, especially considering its low price, the LC 575 is hard to beat.—GENE STEINBERG

MW LAB Macintosh LC 575: How Fast Is It?

CORE-PERFORMANCE INDEX

Times as fast as a Classic (Classic = 1.0).

Use these standard ratings of overall performance, based on a core test suite, to compare systems across classes.

ENTRY-LEVEL-SYSTEM PERFORMANCE TIMES

Times are in seconds. Shorter bars are better.

Use these results to compare the performance of systems for different types of real-world tasks. For each type of system, results can be compared with other *Macworld* Entry-Level-System Performance Times.

Best result in test. Products are listed in decreasing order of overall performance.

	Common	Scientific	Processor	Drive Access	Video Display	Floating Point
	Typical business tasks in Microsoft Excel and Word that use the Mac's processor, drives, and video display.	We added to the common tasks several scientific calculations (which use floating-point math).	Several tasks in Claris FileMaker, ClarisWorks, Deneba UltraPaint, and Microsoft Excel and Word.	File opens in Microsoft Excel and Word, and disk-based sorts in Claris FileMaker.	Horizontal and vertical scrolling in ClarisWorks, and Microsoft Excel and Word.	Scientific recalculations (which use floating-point math) in Microsoft Excel and ClarisWorks.
Macintosh LC 575	11.5	12.5	68	28	90	84
Macintosh LC 550	5.1	5.2	168	47	197	261
Macintosh LC 520 with FPU	4.6	9.0	202	57	245	73
Macintosh LC III	4.0	4.1	268	68	320	432

Silentwriter 640

Personal Laser Printer

PROS: Supports PostScript Level 2; attractive price; good quality and performance. **CONS:** Does not handle single sheets well. **COMPANY:** NEC Technologies (508/264-8000).
COMPANY'S SUGGESTED PRICE: $800.

MW ★★★

REMEMBER WHEN PEOPLE WERE IMpressed by the newsletters and fliers that you cranked out on your loud but reliable ImageWriter printer? Now even your kids' Little League schedule is probably output on a laser printer. These printers have become more affordable, but until recently only QuickDraw printers were available for less than $1000. Today, you can buy a PostScript Level 2 printer for well under a grand.

The NEC Silentwriter 640 is a new member of the under-$1000 PS Level 2 pack. For a street price of about $800 you get a 300-dpi, 6-pages-per-minute laser printer with 3MB of RAM. It is 18 pounds and about the size of a Centris box.

Designed for the Mac, the Silentwriter delivers plug-and-play simplicity. It connects to one or more Macs through its AppleTalk interface. It took me only a few minutes to connect the printer and install the drivers and PostScript Printer Description files. The manual is also Mac-specific, so all the references are relevant. In this cross-platform world, that isn't always true.

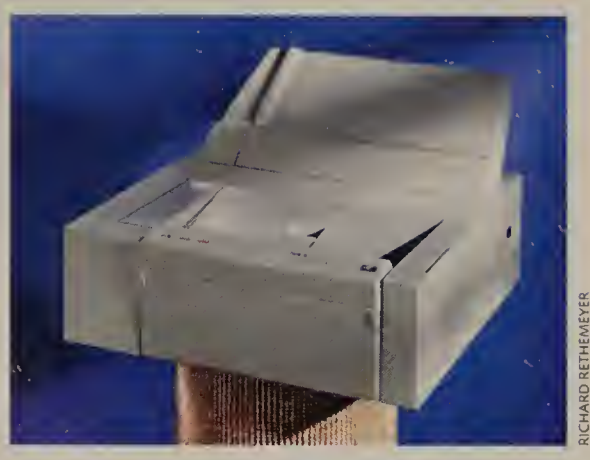
The Silentwriter 640 comes with 17 resident Type 1 fonts and 35 downloadable TrueType fonts, as well as Type 1 and TrueType rasterizers. The built-in rasterizers speed performance by taking the burden of rasterizing fonts away from the computer. Also, the Silentwriter's RAM stores the rasterized fonts for the file being printed, so printing is faster the next time you use those fonts.

A Solid Performer

Using a 6-ppm NEC proprietary engine (the 640 is NEC's shift away from Minolta print engines) and a custom, application-specific integrated circuit (ASIC) that includes an embedded Motorola 68000 processor, the 640 is a capable performer. As Macworld Lab tests show, it's not in the same speed category as Apple's Personal LaserWriter 320 (which uses a 4-ppm engine but has a RISC processor that speeds printing of complex files). However, the 640 is considerably faster than DEC's DECLaser 1152. As it turns out, the timing results line up with the pricing of the three printers. The Apple printer costs slightly under $1000, while the DEC goes for about $700.

Overall, the LaserWriter 320 outperformed the Silentwriter 640. But in our test designed to measure performance in printing a fairly large (20-page), single-font Microsoft Word document, the 640 was faster than the 320 and the 1152. This speed increase is attributable mostly to the 640's faster engine, which, aided by NEC's Forward Memory Technology, increases throughput by processing a page while another page is printing.

Just as the NEC's speed is respectable but not blazing, its output quality is pleasing but not spectacular. The 640 uses NEC's proprietary Sharp Edge Technology (SET) for resolution enhancement, as well as Microfine toner for producing crisper blacks. NEC's SET resulted in crisp text and lines; even our complex Aldus FreeHand tests produced good-quality images. However, if you print many complex illustrations, you'll probably want a 600-dpi printer.



RICHARD RETHEMEYER

Silentwriter 640 from NEC Technologies

Paper Handling

Generally, the Silentwriter 640 represents hassle-free printing. But one problem area is paper handling. The Silentwriter's paper tray holds a respectable 200 sheets of paper and accepts single sheets fed manually. I tested the 640 with transparencies, envelopes, and a variety of paper weights. Feeding single sheets manually was tricky; it was difficult to tell when I had inserted a sheet properly. I endured about half a dozen error messages. And when I did get it to feed correctly, I wasn't sure exactly what I had done right. Also, the heaviest stock the 640 accepts is 28-pound.

The 640 adheres to the EPA's Energy Star specification for power consumption. In standby mode, the 640 consumes less than 30 watts of power; however, it needs to warm up before you can print.

You can specify when the 640 powers down, through the printer's on-screen dialog box; the default is after idling 15 minutes, or you can specify 5- or 10-minute intervals. You can also instruct the printer not to use the power-saving mode.

With 3MB of RAM, PostScript Level 2 support, and a 6-ppm engine, the NEC Silentwriter 640 deserves a spot on your shopping list. Just remember that this is a crowded category and the players and prices are changing all the time, so shop wisely.—DAN MUSE

MW LAB How Fast Is the NEC Silentwriter 640?

Best result for each test. Times are in seconds. Shorter bars are better. Products are listed in decreasing order of overall performance.

Multiple Fonts — Print speed for a typical 7-page Microsoft Word 5.0 document with a variety of fonts, sizes, and styles.

Single Font — Print speed for a 20-page Word 5.0 document with double-space, 12-point Courier text in plain, bold, and italic.

MacDraw Pro — Print speed for a complex drawing with few special effects, over 2000 simple objects, and several lines of Helvetica text.

FreeHand 3.1 — Print speed for a complex graphic with special PostScript effects. Illustration had nonlinear blends and Bézier curves.

PageMaker 4.2 — Print speed for a 4-page newsletter with several fonts, a MacPaint image, and 3 gray-scale TIFF images.

TrueType — Print speed for a 1-page Word 5.0 document containing 4 TrueType fonts in various sizes.

	Multiple Fonts	Single Font	MacDraw Pro	FreeHand 3.1	PageMaker 4.2	TrueType
Apple Personal LaserWriter 320*	187	335	200	776	131	96
NEC Silentwriter 640	333**	230	350	1176	208	146
DEC DECLaser 1152	485	338	406	1264	258	202

*With FinePrint and PhotoGrade off. **Only 4 of 7 fonts required for our test were included. Some of the fonts were printed as bitmap fonts instead.

BEHIND OUR TESTS The printers were tested with a Macintosh IIci with System 7.1, 8MB of RAM, a Quantum LPS230 hard drive, AppleTalk on, and background printing off. The DECLaser printer was tested for comparison.

DOS Compatible Card

PC Coprocessor Card

PROS: Inexpensive; runs faster than some stand-alone PCs. **CONS:** Works in only Centris 610 and Quadra 610; has no PC expansion or networking options. **COMPANY:** Apple Computer (408/ 996-1010). **COMPANY'S SUGGESTED PRICE:** $399.

MW ★★

MAC PURISTS MAY HATE THE IDEA, but Apple has made it clear that compatibility with the PC universe is part of the new Apple. The DOS Compatible Card for Quadra/Centris 610, ungainly name aside, is proof that Apple means what it says. With this card, you can add a PC into the Processor Direct Slot (PDS) on a Centris or Quadra 610.

The card uses the Mac's video, drives, keyboard, and mouse; a control panel lets you switch between the PC and the Mac, or you can show both systems simultaneously if you have two monitors. The PC card comes with Microsoft DOS 6.2 but not Windows 3.1. This is the real thing—not emulation, like Insignia Solutions' SoftPC for 680X0 Macs or SoftWindows for Power Macs.

The card uses a 25MHz Intel 80486SX CPU (one with no math coprocessor), which is comparable in performance to the 25MHz 68LC040 used in a Centris 610. Macworld Lab tests show that the performance of Apple's PC card is about 16 percent faster than a typical 486SX-based PC from Zeos International that we tested, even though the Apple card can't take advantage of Windows optimizations, such as 32-bit disk access. And it matched the performance of the Tandy 486SX PC we used as our basis for comparison. In fact, the PC card's performance matches that of a Quadra 610.

But in several ways, Apple has crippled the PC card. First, it doesn't work in Power Macs, so if you upgrade your 610 to a Power Mac 6100/60, you can't use the card. Second, there is no networking support, so you can't directly connect the PC to your office network, except for printing. (You have to connect the Mac to the network and then transfer files between the Mac and the PC card.) Third, it works in only the Centris and Quadra 610.

The PC card lets you connect to external PC SCSI drives—at least in theory. We found that, even using two of the most common PC SCSI cards (one from Adaptec and the other one from Future Domain), the Apple PC card read files unreliably, sometimes even causing file corruption. While PC SCSI is not as stable as Mac SCSI, we had this problem with only one PC (a Compaq 486SX) of the half dozen PCs we used the cards and drives with.

Apple bundles the DOS Compatible Card with a Quadra 610, but beware: this $1579 Quadra 610 has no math coprocessor, unlike the regular Quadra 610. The bundled 610 also has too little RAM (8MB) and hard disk space (160MB) to run both System 7 and Windows comfortably, especially if you have multiple programs open in each environment. (You'll want 8MB on the PC card and 8MB on the Mac.) You're better off buying a regular Quadra 610 and the PC card separately.

There are a few bright spots. The new version (2.0) of Apple's Macintosh PC Exchange PC-disk-mounting software adds support for PC SCSI hard drives, so you can mount them on the Mac's desktop like a Mac drive. And the control panel that manages the PC card's settings is well designed. The PC card can use the Mac's memory, but only if there is no RAM in the card's SIMM slot.

If you want to integrate a PC into your Macintosh, the best option is to use Orange Micro's OrangePC cards (see *Reviews*, October 1993), which are available in speeds from 25MHz 486SX to 100MHz IntelDX4, and which support external PC networks and expansion cards. The OrangePC cards are more expensive, but they offer more. Plus, they can be used in Power Macs (except the 6100/60).



ROBERT PERRY

This Mac has Intel inside.

All in all, the PC card is essentially limited to people who, say, use a Macintosh at work but need a PC at home for their kids' homework. Clearly, Apple needs to make a more convincing product to fulfill its commitment to working in a multiplatform environment.

—GALEN GRUMAN

MW LAB Which Windows Option Is Fastest?

Best result in test. Products are listed in decreasing order of overall performance.

	CORE-PERFORMANCE INDEX		WINDOWS-PERFORMANCE INDEX			
	Times as fast as a Classic (Classic = 1.0).		Times as fast as a 33MHz 486DX PC (486DX = 1.0).			
	Common Average of results from standard business tasks.	**Scientific** Average of results from standard business and scientific tasks.	**Aldus Info Publisher 2.0** Find and replace, layout reformat, and file-format conversion.	**Lotus Ami Pro 3.01** Report generation, file-format conversion, and data sort.	**Lotus 1-2-3 4.01** Integer and floating-point calculation, file open, and scroll.	**Microsoft Access 1.1** Source-database conversion and data sort.
66MHz 486DX2 (Gateway 2000 4DX2-66V)	23.0	62.1	1.6	1.7	1.4	1.3
33MHz 486DX (AMI 486/33)	15.5	36.3	1.0	1.0	1.0	1.0
25MHz 486SX (Tandy 3100 Model 10)	12.1	12.6	0.9	0.6	0.2	0.6
Apple DOS Compatible Card (25MHz 486SX)	11.9	12.7	0.6	0.7	0.2	0.6
Timbuktu Pro 1.0 controlling the AMI 486/33	11.0	31.1	0.7	0.5	0.3	0.7
SoftPC 3.1 on Centris 650	1.6	2.8	0.1	0.1	0.1	0.1

BEHIND OUR TESTS

Macworld Lab tested three options for running Windows programs on Macs—Apple's PC coprocessor card on a Quadra 610, Insignia Solutions' SoftPC on a Centris 650, and Farallon Computing's Timbuktu Pro 1.0 remotely controlling a 33MHz 486DX-based PC from a Centris 610 over a LocalTalk network—against three business-level Windows PCs. All systems but the Apple PC card and SoftPC used moderately accelerated 8-bit color (because these two Mac products use just standard VGA, they run in 4-bit color).

Yes. Send me my free CD.

I want to put a complete software store on my desk with the free Software Dispatch CD.

☐ I own a CD-ROM drive.
☐ I do not own a CD-ROM drive, but I plan to purchase one soon.

I will be using my CD with:
☐ Macintosh
☐ Windows

Name

Company Name *(if applicable)*

Address Apt/Suite #

City State ZIP

Telephone ( ) Fax ( )

Please complete the questionnaire below:

1 Where is your computer primarily used?
A ☐ Home B ☐ Business C ☐ State/Local Government D ☐ Federal Government
E ☐ K-12 Education F ☐ Higher Education

2. If you primarily use your computer system for business, how many employees are in your company? _____

SOFTWARE DISPATCH

Please allow 4-6 weeks for delivery.

Mail to:
Software Dispatch
PO Box 1745
Brea, CA 92622-9903

NN33

Yes. Send me my free CD.

I want to put a complete software store on my desk with the free Software Dispatch CD.

☐ I own a CD-ROM drive.
☐ I do not own a CD-ROM drive, but I plan to purchase one soon.

I will be using my CD with:
☐ Macintosh
☐ Windows

Name

Company Name *(if applicable)*

Address Apt/Suite #

City State ZIP

Telephone ( ) Fax ( )

Please complete the questionnaire below:

1. Where is your computer primarily used?
A ☐ Home B ☐ Business C ☐ State/Local Government D ☐ Federal Government
E ☐ K-12 Education F ☐ Higher Education

2. If you primarily use your computer system for business, how many employees are in your company? _____

SOFTWARE DISPATCH

Please allow 4-6 weeks for delivery.

Mail to:
Software Dispatch
PO Box 1745
Brea, CA 92622-9903

NN33

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 453 CUPERTINO, CA

POSTAGE WILL BE PAID BY ADDRESSEE

Software Dispatch
PO Box 1745
Brea CA 92622-9903

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 453 CUPERTINO, CA

POSTAGE WILL BE PAID BY ADDRESSEE

Software Dispatch
PO Box 1745
Brea CA 92622-9903

There are dozens of great software products on this CD.



And you can try them all, free.

Immediate access to popular software.

Shopping for software has never been easier. With your Software Dispatch CD, you have demonstrations, trial versions, and information for a wide variety of products at your fingertips. So you can sample them anytime. Then, when you're ready to order, a simple phone call unlocks the complete program, including electronic manuals—right from the CD.

With Software Dispatch, there's no more waiting for delivery. Dozens of products are already on your free CD, and when you call to order, you'll receive the "keys" to access your selections—instantly.

Try them when you want. Buy them when you're ready.

From powerful applications to handy utilities, innovative games, and more, the Software Dispatch CD brings an entire software store to your desk. And complete demos and information mean you can buy with confidence as you enjoy unmatched convenience. So send for your free Software Dispatch CD today. And see how easy software shopping can be.

Yes. Send me my free CD.

☐ I own a CD-ROM drive.
☐ I do not own a CD-ROM drive, but I plan to purchase one soon.

I will be using my CD with:
☐ Macintosh®
☐ Windows
☐ Power Macintosh

Name _____

Company Name (*if applicable*) _____

Address _____ Apt./Suite # _____

City _____ State _____ ZIP _____

Telephone ( ) _____ Fax ( ) _____

NN33

SOFTWARE DISPATCH

Please allow 4-6 weeks for delivery.

Mail to:
Software Dispatch
PO Box 1745
Brea, CA 92622-9894

©1994 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, and Macintosh are registered trademarks of Apple Computer, Inc. Software Dispatch and the Software Dispatch logo are trademarks of Apple Computer, Inc. Offer and product availability are subject to change. Offer and CD are valid only in U.S.A. Offer expires 12/31/94

What have you got to choose?



Comp

Choose the thermal wax mode for fast, inexpensive color comps, layouts and drafts.

Final

Choose the dye sublimation mode to output photo-realistic proofs right from your desktop

Introducing The Only Photo-Realistic Printer That's Actually Two Printers In One.



You want accurate photographic-quality prints to show your work at its best. And you want bright saturated color that won't cost you an arm and a leg for each page you print. Does that mean you need two color printers?

Not if you have the multi-technology Professional ColorPoint 2 PSF. The only 300 dpi full-bleed tabloid sized color printer with two printing technologies in one.

When color accuracy and realism count, you can choose the dye sublimation mode. You can output full-bleed tabloid pre-press color proofs, digital photographs or final color comps in sharp 24-bit continuous tone color. Without wasting time at a service bureau. But that's just the beginning.

This printer is also a low-cost thermal wax transfer printer. Just swap the media and ink sheet and you can output color layouts and quick comps in vivid color for about one-sixth the cost of dye sub prints. And the Professional ColorPoint 2 PSF comes standard with features like embedded Adobe PostScript Level 2® software, a fast Intel RISC processor, a 160 Mb internal hard disk, automatic page cutting and more.

Adobe PostScript

So whether you're in graphic design, architecture, science or medicine, the Professional ColorPoint 2 PSF has the power and flexibility you need. Because for high-quality dye sublimation and low-cost thermal transfer technologies in one printer, it's more than the right choice. It's the only choice.

Call now for more information 1-800-888-0817.

SII
Seiko Instruments

© 1994 Seiko Instruments USA Inc. Professional ColorPoint 2 PSF and It's The Choice are trademarks of Seiko Instruments USA Inc. PostScript Level 2 is a registered trademark of Adobe Systems Inc. All other trademarks are the property of their respective companies.

Circle 149 on reader service card

Deck II 2.1

Digital-Audio Recording Software

PROS: Records and plays up to eight simultaneous tracks on a Quadra 840AV (up to six on a 660AV); attractive, elegant interface; excellent automation, MIDI, and QuickTime support. **CONS:** No equalization features; copy-protected. **COMPANY:** OSC (415/252-0460). **LIST PRICE:** $399.

MW ★★★

WHEN APPLE INTRODUCED THE AV Macs last year, multimedia producers and musicians thrilled at the notion of recording and playing back CD-quality audio without paying a four-figure price for a board such as Digidesign's Audiomedia II.

OSC's Deck II lets an AV Mac strut its stuff. The original Deck was marketed by Digidesign and worked with that firm's sound hardware. Deck II is sold by OSC and works with the AV Macs as well as with several Digidesign cards; with RasterOps' MediaTime card; and with Spectral Innovations' NuMedia card, which uses the same AT&T 3210 digital signal processor (DSP) chip as the Quadra 660AV and 840AV.

Deck II turns a Macintosh into a multitrack digital-audio workstation that enables you to record, mix, modify, and play back CD-quality sound. Many of Deck II's windows mimic common recording tools: there's a Mixer window with sliders and volume meters for adjusting sound levels, and a Transport window with play, pause, record, rewind, and fast-forward buttons.

After you've recorded one track, you can add material to other tracks. For example, you can add background music to narration or turn yourself into a one-person barbershop quartet. When you've filled seven tracks on an 840AV, for instance, you can combine (or *bounce*) them onto the eighth track, thereby freeing the original seven for still more overdubs. You can do all this with a multitrack tape deck, of course, but sound quality suffers when you bounce tracks on analog tape decks. Not so in the digital world, where you can bounce until you run out of disk space without compromising sound quality.

Deck II can record at either of two sampling rates—44.1kHz (the standard compact disc rate) or 48kHz (used by some digital audiotape decks)—with 16 bits of resolution. You can convert a track or combination of tracks to 11kHz or 22kHz with 8 bits of resolution; you might do this when exporting a finished recording you'll use in a program such as HyperCard, Adobe Premiere, or Macromedia Director.

Deck II provides all the goodies you would find in a high-end digital-audio recorder. A punch-in–punch-out feature lets you rerecord portions of a track by switching into and out of record mode at specified times. You can create audio bookmarks to quickly jump to specific sections of a recording. And you can *scrub* a recording—slowly play it forward or backward to locate an exact point, such as the start of a sentence.

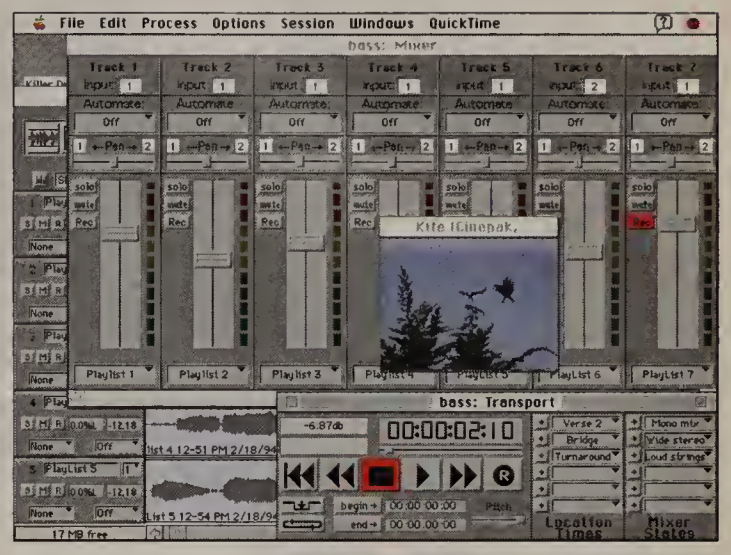
With Deck II's Mixer window, you can pan recorded sounds to make them come from the left channel, the right channel, or anywhere in between. You can even pan during playback to make a sound whoosh across the stereo field. You can adjust the playback levels of each track—to boost the background music during a pause in the narration, for example. And you can record your panning and volume adjustments so that they repeat each time you play the recording. None of these adjustments alter the original recording—this technique is called *nondestructive* editing—so you can punch in multiple takes and create as many mixes as you like.

Deck II also provides several *destructive* editing features that adjust volume levels and fade tracks. But the program can't edit sound at the waveform level; you can't, for instance, remove a sneeze in a narration. For jobs like this, you'll need a waveform editor such as Digidesign's Sound Designer II (which at this writing works only with Digidesign's hardware).

Deck II provides no equalization (EQ) features, which would let you boost or attenuate certain frequencies to improve a recording's tonal qualities. A forthcoming multitrack digital-audio program, Alaska Software's DigiTrax (408/738-3320), offers EQ and supports up to six simultaneous tracks, but the prelease version I examined lacked Deck II's extensive automation capabilities.

Deck II offers excellent support for MIDI sequences and devices. You can import MIDI files so that Deck II plays them back while you record audio tracks—great for combining vocals with a MIDI sequence.

Deck II is also a superb tool for working with QuickTime movie sound tracks. You can import sound tracks from QuickTime movies and export Deck II recordings as QuickTime sound tracks. You can use these features, say, to import a QuickTime movie of an interview, add a musical background, and then replace the movie's original sound track with the combination of the music and narration. Deck II can also display live video from a camcorder or VCR connected to an AV Mac's video-input jack.



Deck II's Digital Studio Deck II's Mixer window lets you adjust volume and panning. The Transport window (bottom right) allows you to navigate within a recording; note the markers for quickly jumping to specific points. With the track window (lower left, behind the others), you can bounce, arrange, and otherwise manipulate tracks.

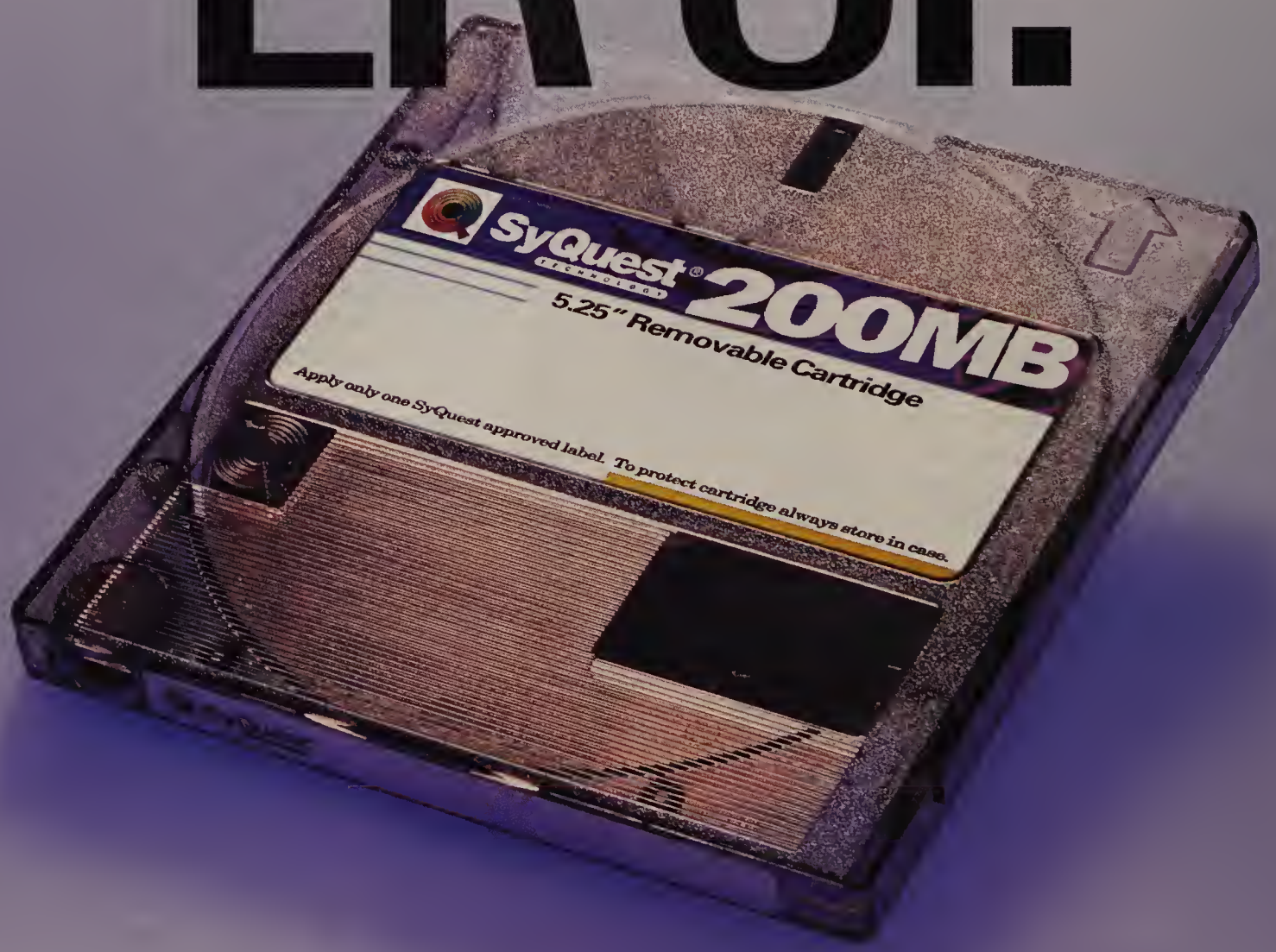
I found Deck II to be more robust than most digital-audio programs, many of which require you to disable all but the essential extensions and can be unreliable if you don't. Deck II coexists happily with other programs—indeed, as I'm writing this in Microsoft Word, Deck II is playing eight tracks of audio in the background.

Deck II uses a relatively unobtrusive form of copy protection. You can install the program on up to two hard drives by "authorizing" the drives with the installation program. (If you simply copy Deck II's icon to your hard drive, the program will ask you to insert the master floppy each time you start it.) Unlike some early authorizing schemes, Deck II's system is not affected by disk-defragmenting programs.

OSC's Deck II is a dream come true for AV Macintosh users. It is able to handle nearly any audio task you can throw at it (the exceptions being waveform editing and equalization), and it's the best tool available for doing QuickTime audio postproduction work. Seeing this program running alongside the likes of Word and Excel illustrates just how wonderfully versatile the AV machines are.

—JIM HEID

FILL 'ER UP.



Introducing The New SQ5200C Drive. The Biggest Reason Yet To Join Our 5.25" Family.

The SQ5200C delivers big in data-intensive applications such as desktop publishing and multimedia, with 200MB of storage, hard drive performance, and full read/write compatibility with all SyQuest 44MB and 88MB cartridges. Plus all the advantages of removability, like unlimited capacity, off-line storage, system sharing, fast backup, and unbeatable data security and transportability.

FEATURING SyQuest REMOVABLE TECHNOLOGY

Look for this logo when buying removable storage products.



Sales of more than 6 million cartridges and 1 million drives have made SyQuest the world standard in removable storage.

If you're a SyQuest user, it's the best way to migrate to the next level of storage. If you're looking to SyQuest for the first time, it's the biggest reason yet to join the world standard. To find out how to get more mileage out of your demanding applications, call 1-800-245-2278.

SyQuest TECHNOLOGY

The World Standard.

1-800-245-2278. SyQuest Technology, Inc., 47071 Bayside Parkway, Fremont, CA 94538. SyQuest and the SyQuest logo are registered trademarks of SyQuest Technology, Inc. © 1994 SyQuest Technology.

Circle 249 on reader service card

WriteNow 4.0.1

Word Processor

PROS: Fast and small with intuitive interface; elegant new table capabilities; graphics now easily imported, sized, and cropped; Merge Helper facilitates creation of merge documents. **CONS:** Tables limited to single page; fonts in EPS graphics aren't downloaded to printer; difficult to reach technical-support staff. **COMPANY:** WordStar International (415/382-8000). **LIST PRICE:** $119.95.

MW ★★★★

WRITENOW HAS LONG HAD ITS enthusiastic supporters. The tidy word processor boasts speed, modest memory requirements, strict WYSIWYG display of pages, and a relatively uncomplicated interface. But a few missing features—the ability to insert and customize tables and to easily import, size, and crop graphics files, chief among them—have kept WriteNow out of the big leagues. With this release, both longtime users and those interested in switching to a more memory-efficient word processor are in luck.

Tables are the splashiest new feature. Creating a table is easy. You choose Insert Table from the Format menu, and a dialog box displaying eight predefined table types appears. Choose a style, enter the number of rows and columns you need, and voilà, the table appears in your current document at the point you last left your cursor. A narrow, vertical Table Tool palette makes it easy to add or delete rows or columns; divide or merge adjacent cells; and define single-, bold-, or double-line borders.

Additionally, creating a table from imported tab-data couldn't be easier. You simply import the file in tab-delimited format, select the appropriate range of data, and then choose Text to Table from the Format menu.

The new table features are well designed. Cells expand to accommodate text or graphics. Selections are limited to rectangular arrays of cells, but the process is straightforward: hold down the shift key and click on the first and last cells in your selection; you can also click and drag to select cells.

Formatting is a cinch. An inserted table automatically expands to fit within the margins of the document. To change individual column, row, and cell widths, you select an array of cells and drag a corner or an edge to the desired position. Customizing font display is as easy as changing or creating Table Styles. And you can use WriteNow's expanded palette of 88 colors to enliven table fonts, borders, and cell backgrounds.

The biggest drawback to WriteNow's implementation of tables is that they can be no larger than a single page. You can't split a table across pages without physically creating another table. This option is most inconvenient if you need to change styles and layout midstream. The fact that WriteNow can import Microsoft Word tables is wonderful—unless the table is larger than a page, of course. In this case, you simply lose any data beyond the first page.

WriteNow 4.0.1 offers improved handling of graphics. Besides importing EPS, PICT, and MacPaint graphics, you can now size, crop, and reposition them for better display within a document. Once again, though, graphics files are constrained to the size of your page.

One serious problem with the handling of EPS files is that PostScript fonts included in a file are not downloaded and so do not print correctly. Sophisticated users may think to include an invisible character in each needed font in a text line preceding the graphic; this ensures that the font is downloaded, but it's an awkward workaround.

The new version greatly simplifies the creation of merge documents. You first generate a data document that lists the fields you want to include in your template document. Then, while you're working on the template document, the Merge Helper window offers two pop-up menus. The first lists merge commands (IF, IF ELSE, ASK, and NEXT, for instance). To generate the list in the second pop-up menu, WriteNow scans your data document and offers field choices. When you choose options from Merge Helper menus, WriteNow inserts them into the template document with the appropriate cue markers.

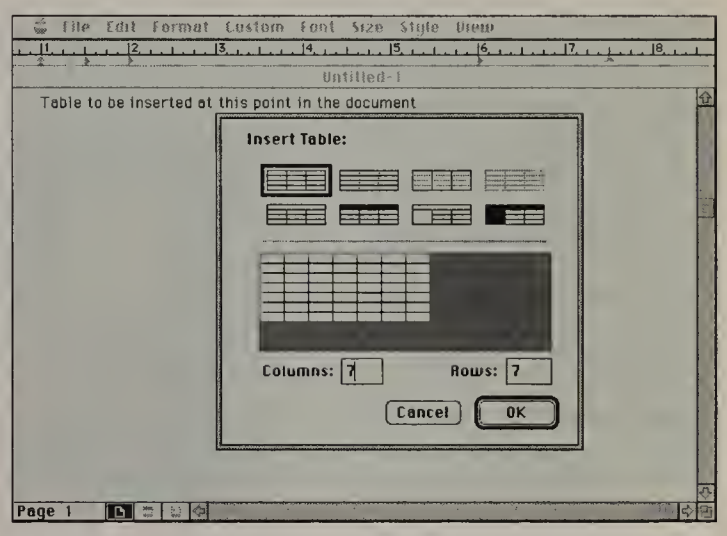
PowerBook users will find several useful new features. A memory-optimization scheme reduces the number of times WriteNow must go to the hard disk. A Battery Indicator extension keeps you posted on the status of your battery. And perhaps most important for those using passive matrix screens, the Large Text Cursor option fattens the often-hard-to-find I-beam.

Those who upgraded early to version 4.0 faced several bugs. WriteNow icons, both application and document, sometimes switched to generic icons. Lines of type flickered in a most annoying manner. Using the WriteNow-to-RTF filter sometimes caused crashes. And users employing system enablers such as Connectix Mode 32 had printing problems. Version 4.0.1 neatly wipes out the bugs. Plus, it adds the ability to save 4.0 documents in version 2.2 format, a necessary workaround for QuarkXPress users.

There are still a few features that users may be pointing to on their wish lists. WriteNow includes no outlining, glossary, or annotation capabilities. To create outlines, you must tediously apply the Move Margin Right (or Left) to Tab commands. Many users may want a separate user dictionary. Some formatting niceties, such as keeping lines together on a page or defining spaces before and after paragraphs, are still missing. A feature that would allow users to move text using a simple drag-and-drop option would be a blessing. And some users would like the option, say, when scrolling, to forgo the strict WYSIWYG display that shows headers and footers for each page. Finally, the sale of WriteNow to giant WordStar International means that users often wait endlessly for someone to answer the technical-support lines.

Still, WriteNow is more than adequate for many word processing needs; and as more and more users find themselves hauling around laptops, WriteNow's conservative use of memory (the application fits into a dainty 600K partition) and graceful interface will continue to win it enthusiastic fans.

—SUZANNE STEFANAC



Easy Tables After choosing Insert Table from the Format menu, you pick one of eight table styles. To determine the number of columns and rows in the table, either enter numbers into the appropriate boxes or click in the gray display area next to the table to add rows or columns.

Now Full Screen Full Motion, No Compromise Desktop Video.

Only VideoVision Studio™ lets you input, capture, display, edit, add special effects, mix sound and output full-screen video at 30 frames and 60 fields-per-second.

Radius' VideoVision Studio gives you a complete, no compromise, professional quality, 24-bit, QuickTime™ compatible desktop video production system for less than $4,500.

And for that you get full-screen, full-motion, flicker-free videos directly from your Macintosh.

No other desktop system even comes close to offering you such an incredible array of capabilities, so incredibly priced.

And right now, VideoVision Studio comes specially packaged with the hottest video editing and effects software, Adobe Premiere™ and VideoFusion™.

VideoVision Studio is also available as an upgrade for current VideoVision users, at a very special price.

And it's all backed by our Worry-Free Warranty and overnight replacement policy.

For complete details and the name of your nearest Radius reseller, call 1-800-227-2795 Ext. 11C. Or call us now at 1-800-966-7360 to receive faxed information.

Get VideoVision Studio. And get the true picture in desktop video production, without compromise.

VIDEOVISION STUDIO radius™



© 1993 Radius Inc. Radius, the Radius logo and all Radius product names are trademarks of Radius Inc. Other brand and product names are trademarks of their respective holders.

Circle 14 on reader service card

ClarisImpact 1.0

Business Graphics Software

PROS: Wonderful integration of text and graphics; useful graphing and charting models. **CONS:** Presentation function lacks thumbnail slide sorter. **COMPANY:** Claris Corporation (408/727-8227). **LIST PRICE:** $399.

MW ★★★★

OVER THE YEARS, INTEGRATED software has been the subject of so much marketing hype that it's easy to lose sight of its real potential. But when you think about it, the concept of consolidating applications to address a common purpose is a wonderful idea. And that's the key to ClarisImpact, a product designed to facilitate organizing and communicating information.

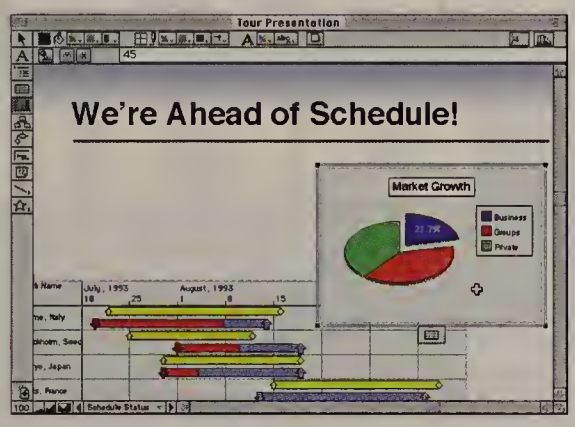
ClarisImpact integrates business graphing, project management, object-oriented drawing, word processing, and presentation functions. It lets you organize and illustrate data with a variety of charts and graphs, add graphical embellishments, incorporate textual descriptions, and disseminate the finished product as a paper-based report and visual presentation.

ClarisImpact blends its components into an exceptionally versatile graphics-production environment that is significantly more approachable and far more comprehensible than is juggling a similar collection of dedicated programs. So you don't have to be a graphics professional to master ClarisImpact quickly.

ClarisImpact lets you produce three document types. Report documents, which you produce in a word processing–style window, emphasize textual information and are appropriate for projects that require paginated output, such as business plans, annual reports, and newsletter articles.

You build draw documents in a MacDraw-like work space where it's possible to position graphic objects and text elements with precision. Draw documents are especially suited to projects that can grow beyond single-page boundaries, such as organization charts and project time lines.

Presentation documents are collections of sequential images built on a template or master slide. Naturally, these documents are intended for producing slides, overheads, and computer-driven productions. However, ClarisImpact provides the same tool palette and attributes bar regardless of document type, so you can always do the same kind of graphics and text work.



Editable Models Even within a finished presentation, ClarisImpact's graphics models remain active and editable.

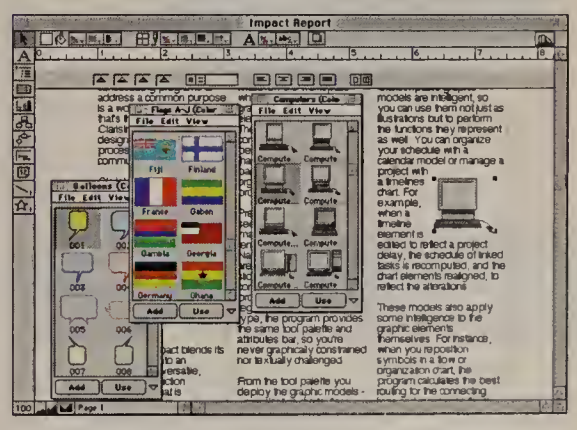
From the tool palette, you select the graphic models—organization charts, flowcharts, time lines (Gantt charts), calendars, outlines, data tables, and data graphs—that are the core of ClarisImpact. Select a model and drag out a frame in the document window, and that graphic model is available for immediate use. For example, when you choose an organization chart model, you can enter information in the formatted boxes of a basic hierarchy and, by pushing buttons on the model, alter and expand the organizational structure as necessary. Menus and tool bars, which contain the particular functions pertaining to each graphic model, toggle on or off as you select models.

ClarisImpact's graphic models are intelligent, so you can use them as more than illustrations. You can organize your schedule with a calendar model or manage a project with a time-line chart. For example, when you edit a time-line element to reflect a project delay, ClarisImpact recomputes the schedule of linked tasks and realigns the chart elements to reflect the alterations.

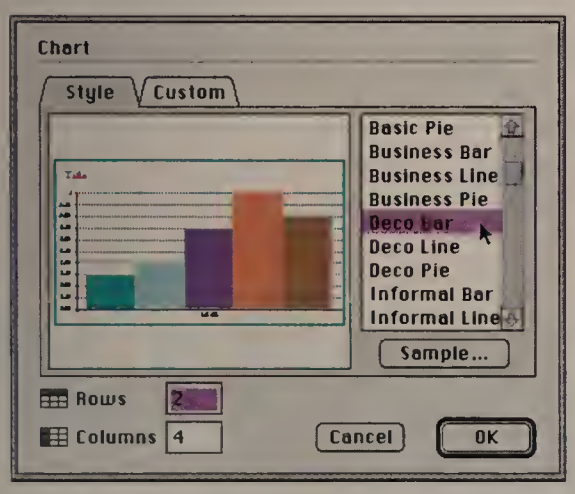
These models also apply some intelligence to the graphic elements themselves. For instance, when you reposition symbols in a flowchart, the program calculates the best routing for the connecting lines and automatically rearranges them. In addition, you can edit data graphs bidirectionally—change the data in the table, and the graph adjusts to match; reconfigure the graph, and the data updates automatically.

Overall, ClarisImpact's collection of charting and graphing models covers the business-graphics requirements of most users. Although they won't supplant dedicated programs, the individual models offer more than sufficient functionality. Many users will never need more.

An extensive implementation of styles makes it easy to customize graphs and charts. Similar to the styles functions found in word processors, ClarisImpact's styles control every attribute that can be applied to a model, such as the type of graph, text size and font, colors and fill patterns applied to elements, and overall layout of the model. You can define, save, and apply styles either globally or to individual model elements. A filtering function lets you apply a subset of a style. The program comes with an extensive collection of styles ready for use or customization, and these canned styles share familial characteristics, making it easy to change from one layout to another or to combine several model types that share a graphic look.



Drag, Drop, Wrap Libraries of drag-and-drop images and automatic text-wrap make combining text and graphic objects a snap.



Stylishly Appointed ClarisImpact offers a large selection of ready-to-use styles to give graphs and charts a coherent look.

Drawing tools can be torn off the tool palette for use with any ClarisImpact document. For the most part, they are fairly basic. Notable, however, are the Bezigon tool, which draws Bézier-curve shapes, and the Note tool, which produces editable Post-it–style notes you can attach anywhere on a document. In addition, a second tear-off palette holds 16 shapes, including polygons, stars, and arrows.

continues



Now you can print from your Macintosh™ to over 1,000 PC-compatible printers.

You can have the power-to-print whether you're on the road with your PowerBook™, at home using an old PC printer, or sharing PC printers on a network. PowerPrint's cable-and-software package gives you instant access to just about any laser, inkjet, dot matrix, color, or fast wide-carriage printer.

PowerPrint Costs Less Than $150.
And includes features like built-in spooling, scaling, and custom paper sizes. It's compatible with TrueType™ and Adobe Type Manager™ fonts.

Available in Network Versions.
PowerPrint/LT™ for LocalTalk™ networks. PowerPrint/NW™ for Novell® NetWare® printing services.

Call 800-663-6222 for information, or contact your dealer.

Upgrade to 2.5 and Get the Power of Color!

Why you should upgrade from Grappler™ or MacPrint™, for **$75.**	PowerPrint 2.5 is much faster, provides access to color printers like the Canon BJC-600 and the HP DeskJet 550C. Plus, features like quality background printing and better compatibility.
Current owners of PowerPrint can upgrade for **$35.**	And get 32-bit color and grayscale printing, print preview and support for new printers.

GDT SOFTWORKS
INCORPORATED
4664 Lougheed Highway
Suite #188
Burnaby, BC
Canada V5C 6B7
800-663-6222
604-291-9121
604-291-9689 (fax)
AppleLink:GDT MKT

MacUser 100 · MW Editors' Choice · yes It runs with NetWare · 4 Apples Mac Home Journal

All p[illegible] are trademarks [illegible] registered trademarks of the [illegible]

UPGRADE NOW! AND ENTER TO WIN A CANON BJC-600 COLOR PRINTER!

PowerPrint™

THE MACINTOSH PRINTING SOLUTION™

Circle 32 on reader service card

Circle 42 on reader service card

ClarisImpact's graphics libraries are accessible from floating palettes containing individual thumbnail images, which you can drag and drop. You can add graphics to existing libraries and create your own libraries. Library graphics traveling to the page pass through the Clipboard rather than a separate channel, so you must be careful not to overwrite the Clipboard's contents. Still, the library interface is well implemented, and the program comes with more than 3000 clip art objects.

Text handling is generally fine. When building report documents, ClarisImpact behaves like a well-appointed word processor that includes such page-layout features as columnar formatting, text wrap around graphic objects, and footnoting. Similar text-handling features are available in text-object frames created with the text tool in draw and presentation documents. You can link these frames to flow text over several locations.

You can also use text frames within report documents, as you might with a caption inside a balloon graphic object. But more complex juxtapositions, such as flowing text over linked frames inside that balloon—admittedly an uncommon situation—can confuse the program as to where the text goes. Still, ClarisImpact's integration of text and graphics is usually excellent.

ClarisImpact supports QuickTime, so you can include video clips in computer-generated presentations. However, the program should offer the ability to visually sort through a presentation using thumbnails. The name-oriented slide manager is flexible enough, but it requires that you christen each slide with a distinctive name and retain a mental picture of its content—not a problem with a half-dozen slides but cumbersome if you're producing a gross.

Program documentation is well organized, readable, and thorough. Novice users should have no difficulties getting started. And ClarisImpact runs even on a Mac Plus with 2MB of RAM. Mindful of such minimalist users, Claris has included a good selection of monochrome styles and clip art libraries.

Taken individually, ClarisImpact's components naturally suffer in comparison with dedicated programs. But the program's outstanding integration offers versatility that dedicated programs are pressed to match. And the components mesh so well that each enhances its companions, much as the members of a well-drilled basketball squad do. By emphasizing teamwork, ClarisImpact realizes the potential of software integration.

—CARLOS DOMINGO MARTINEZ

Typestry 2.0

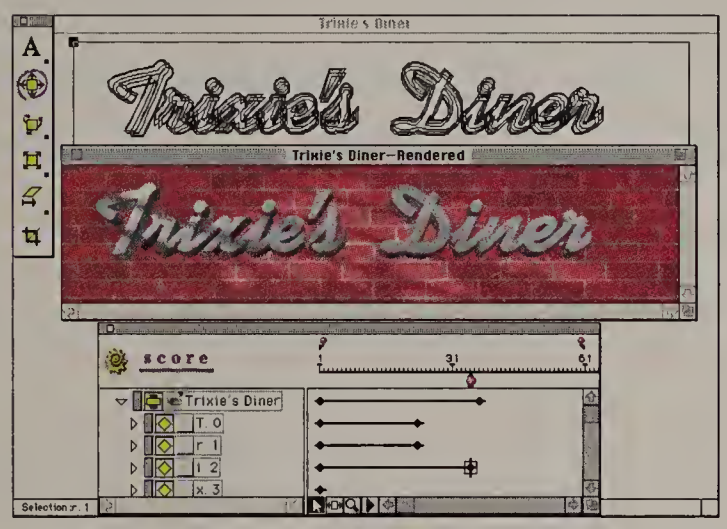
3-D Renderer for Type

PROS: Superb rendering; many new features; good QuickTime support; good documentation. **CONS:** Can't access a font's stylistic variants if the screen font isn't installed; no canned positioning effects. **COMPANY:** Pixar (510/236-4000). **LIST PRICE:** $299.

MW ★★★

PIXAR TYPESTRY'S APPROACHABLE interface, animation support, and outstanding RenderMan rendering technology have made it a popular choice among graphic designers and QuickTime movie producers needing to create 3-D text effects.

Typestry 2.0 improves on the original version's straightforward operating style and adds some significant new features. Typestry 2.0 can import images in Adobe Illustrator 3.0 (and later) format, enabling you to add 3-D effects to logos and the like. New object-building options let you place letters on tube shapes and on "rubber sheets," which bend and flutter in a variable digital wind. Typestry's animation capabilities let you animate flags that flutter, distorting their text as they wave. The new particle system simulates everything from fireworks to bubbles to falling snowflakes.



Typestry 2.0 To rotate and manipulate objects, you operate on them in the wire-frame view (top), and the rendered image appears below. (My Quadra 840AV rendered this one in about 12 minutes.) The Score window (bottom) controls animation and object grouping.

Like its predecessor, Typestry 2.0 opens with an untitled window and a tool palette for creating new text objects and for moving, rotating, and resizing them. Creating a text object involves clicking on the text tool to display the text dialog box, which lets you specify the depth of the text and choose a font from a pop-up menu. Typestry's biggest limitation—one that I pointed out when I reviewed version 1.0—is that you can't access stylistic variants of a font (italic, bold, bold italic) unless you've installed the screen fonts for those variants. Most PostScript Type 1 fonts include screen fonts for style variants, but TrueType fonts don't, so you're limited to using the plain style of a TrueType font.

You can bevel type characters to produce a rounded, routed-out, or sharp-edged appearance, and you can now create and save custom bevel shapes. You can also now customize Typestry's *looks*—its library of dozens of surface properties such as chrome, bricks, and stucco. (Pixar One Twenty Eight, a CD-ROM containing 128 additional textures, is available for $299 list price.)

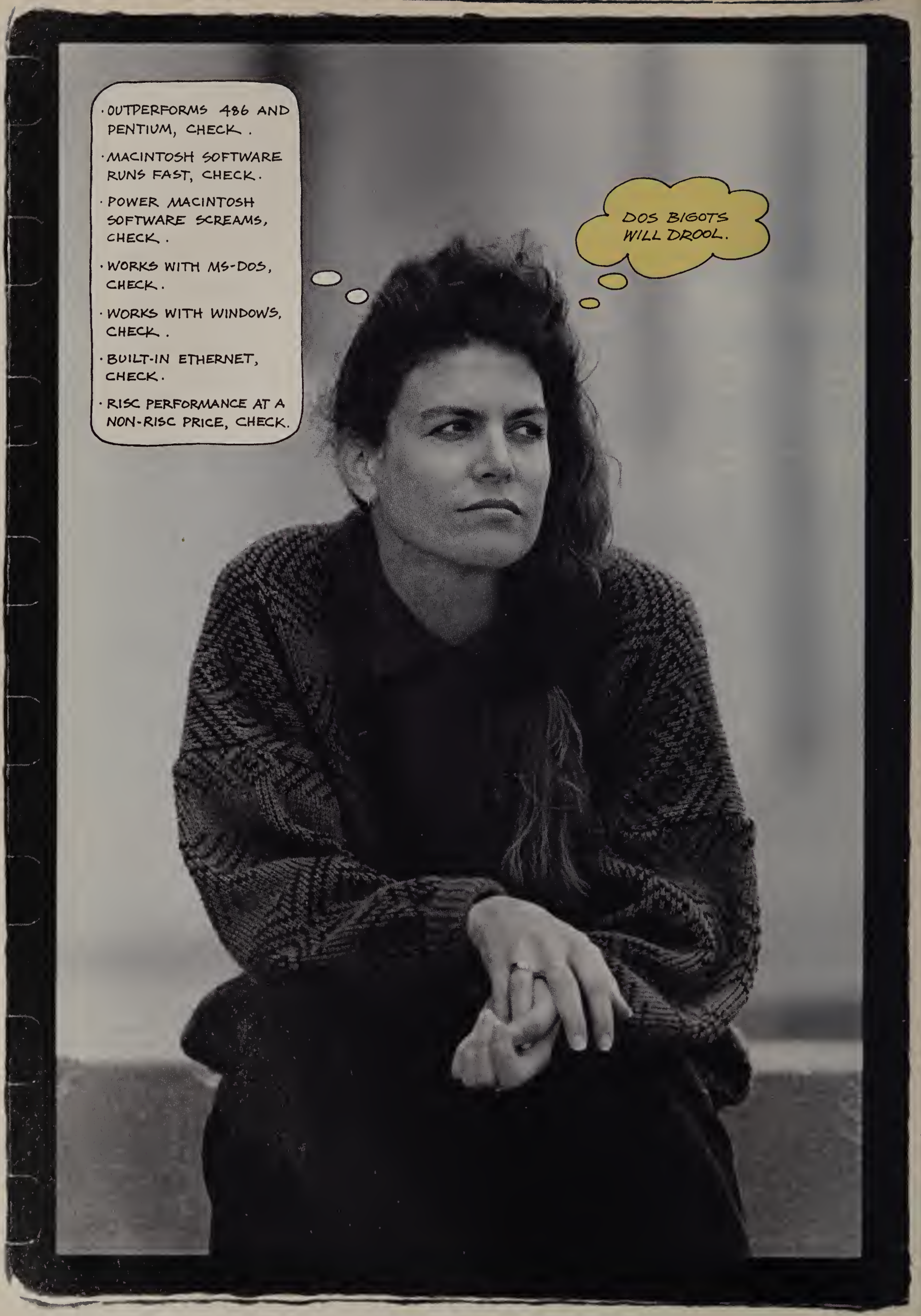
Typestry's already excellent lighting features—nine front lights and nine back lights—are largely unchanged in version 2.0, except for the inclusion of a new light that adds reflections to shiny objects. It's easy to experiment with coloring and repositioning lights and with adding gels, to cast shadows that simulate venetian blinds, spotlights, windowpanes, and more. Residents of London and Los Angeles will be glad to know that Typestry's electronic atmosphere now includes fog and haze effects.

Typestry 2.0's animation features, on the other hand, are greatly improved. You still alternate between moving objects and creating keyframes, letting the program tween the required intermediate frames. But the new Score window provides better control over keyframes and makes it easier to ungroup text objects so that characters move individually.

The new, full-color manual—loaded with step-by-step instructions, practical tips, and a detailed index—is a vast improvement over Typestry 1.0's friendly and informative but poorly organized and unindexed manual.

Typestry 2.0 requires roughly 5.3MB of free memory, but 10MB or more is better; an 8MB Mac can easily run out of memory when rendering an image at highest quality settings. Still, in my tests the program was rock-solid, even when I switched between other applications while rendering in the background. If you want to create 3-D text for a page layout, a multimedia production, or a QuickTime movie, you want Typestry 2.0.

—JIM HEID


· OUTPERFORMS 486 AND PENTIUM, CHECK.
· MACINTOSH SOFTWARE RUNS FAST, CHECK.
· POWER MACINTOSH SOFTWARE SCREAMS, CHECK.
· WORKS WITH MS-DOS, CHECK.
· WORKS WITH WINDOWS, CHECK.
· BUILT-IN ETHERNET, CHECK.
· RISC PERFORMANCE AT A NON-RISC PRICE, CHECK.
DOS BIGOTS WILL DROOL.

What would you
think of a computer that's
more powerful
than a PC, more human
than a Macintosh
and designed to work
with both?

Think of it as the Macintosh for people who can't get enough Macintosh.

It starts with the thunder of a new start-up sound. A sound that offers both comforting familiarity and a signal that something has changed dramatically.

Introducing Power Macintosh™ personal computers.

A new chip. A new architecture. A new standard of performance and value — not just in Macintosh®, but in all of personal computing. Yet it was designed to make your current Macintosh investment more valuable than ever.

It's more powerful.

At the heart of Power Macintosh is the PowerPC™ 601 microprocessor: the first of a new family of ultra-high-performance RISC chips developed in a unique three-year collaboration between Apple, IBM and Motorola.

RISC technology brings a whole new level of performance to personal computing. Software written to take advantage of its unique capabilities, in fact, will blow the doors off the same programs written for 486 PCs – and can run significantly faster than programs for Pentium processor-based PCs.

The difference in Macintosh applications rewritten to take advantage of RISC is equally dramatic. Adobe Photoshop 2.5, for example, can run up to 4 times faster than it can performing the same tasks on a Macintosh Quadra®. This makes any Power Macintosh ideal for processing-intensive jobs in design, graphics, publishing, engineering, architecture or multimedia.

Power Macintosh	6100/60	7100/66	8100/80
Processor	*PowerPC 601*	*PowerPC 601*	*PowerPC 601*
Speed	*60 MHz*	*66 MHz*	*80 MHz*
Memory	*8MB to 72MB*	*8MB to 136MB*	*8MB to 264MB*
Expansion slots	*1 PDS or NuBus*	*3 NuBus*	*3 NuBus*
Hard disk storage	*160MB or 250MB*	*250MB or 500MB*	*250MB to 1GB*
Video support	*DRAM*	*DRAM, VRAM 1MB to 2MB*	*DRAM, VRAM 2MB to 4MB*
Networking	*Ethernet*	*Ethernet*	*Ethernet*
Apple Price	*From $1,819*	*From $2,899*	*From $4,249*

All this plus built-in Macintosh PC Exchange,™ AppleScript,™ QuickTime™ software, TrueType™ fonts, GeoPort™ serial ports, 16-bit stereo audio input and output, file sharing without a dedicated server and more.

It's more human.

A Power Macintosh makes it easy for you to work the way you want to, in whatever way works best for you.

In addition to software accelerated for its RISC architecture, a Power Macintosh will also run almost all of the thousands of Macintosh personal productivity applications that run on System 7.

Many Power Macintosh configurations also come bundled with SoftWindows, software that enables Power Macintosh to run hundreds of off-the-shelf MS-DOS and Windows programs at 386 and 486 performance levels. This makes it easy for a Power Macintosh to work side by side with the



From left, the Power Macintosh 8100/80, Power Macintosh 7100/66 and Power Macintosh 6100/60.

Effective 3/14/94. Apple Price is for the Power Macintosh 6100/60 with 8MB of memory and a 160MB hard drive. For the sake of custom configuration, keyboard, monitor and mouse are sold separately. Unless bundled with a particular configuration, SoftWindows must be purchased separately. Available on Performa 600. There are two ways to upgrade. The Power Macintosh Upgrade Card (Apple Price from $699) or a complete logic board swap (Apple Price from $999). Not every model offers both upgrade options. *©1994 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, Macintosh, Macintosh, and Business Machines Corporation, used under license therefrom. SoftWindows is a trademark of Insignia Solutions Inc.*

PCs and Macintosh computers you already own.

RISC also provides a foundation for a wide range of capabilities you'll need in the future — including speech recognition, integrated voice mail and desk-to-desk videoconferencing — plus significant improvements in image quality for QuickTime videos.

It's more room to grow.

You don't need a new computer to take advantage of Power Macintosh performance.

Many Macintosh models are upgradable to Power Macintosh immediately — quickly and inexpensively.

This not only means your current investment is protected. It also means you can buy a Macintosh Quadra today and upgrade whenever you need to.



Many Macintosh models can be upgraded to Power Macintosh right now – for as little as $699.†

Of course, Apple's plug-and-play philosophy of personal computing makes moving to Power Macintosh as easy at the hardware level as it is at the software level.

A Power Macintosh can use the same keyboards, expansion cards, monitors, printers and external peripherals as your current Macintosh system. And of course, you can connect Power Macintosh and Macintosh computers and Apple® Workgroup Servers together on the same network.

It's as little as $1,819.†

As you might expect, a Power Macintosh computer is not a stripped-down Macintosh.

In the Macintosh tradition, all sorts of features that would normally cost you extra on ordinary PCs come as standard equipment: high-speed Ethernet networking, file-sharing software and CD-quality sound.

Of course, nothing beats a hands-on demonstration, something your authorized Apple reseller will be happy to arrange. For the name of the one located nearest you, call 800-732-3131, ext. 600.

And discover even more of the power that has made Macintosh computers the most imitated personal computers in the world. The power to be your best.®

Software accelerated for Power Macintosh.

This is just a fraction of the software that is now or soon will be available in versions accelerated for Power Macintosh.

ACI 4th Dimension
Adobe Illustrator
Adobe Photoshop
Adobe Premiere
Agfa-Gevaert N.V.
Aldus FreeHand
Aldus PageMaker
Aldus Persuasion
Alias Sketch!
auto•des•sys form•Z
Claris ClarisWorks
ClarisImpact
Electric Image Animation System
Fractal Design Painter
Frame FrameMaker
Graphisoft ArchiCAD
Great Plains Dynamics Release Two
Insignia Solutions SoftWindows
Language Engineering LogoVista E to J
Leaf Systems
Lotus cc:Mail
Macromedia Authorware Professional
Macromedia Director
Macromedia MacroModel
Microsoft Excel
Microsoft Word
Nisus Writer 4.0
Oracle7
QuarkXPress
Radius RocketShare
Radius VideoVision Studio
RasterOps Horizon 24
Ray Dream Designer
Scitex Corporation Ltd.
Specular International Infini-D
Strata StudioPro
SuperMac cards and peripherals
VideoFusion
Virtus WalkThrough
Wolfram Research Mathematica
WordPerfect 3.0
WordPerfect Office

Introducing Power Macintosh.

Apple

†prices may vary depending on location. The following Macintosh computers can be upgraded to Power Macintosh: Macintosh Quadra 610, 650, 660av, 700, 800, 840av, 900 and 950; all Apple Workgroup Servers; all Macintosh Centris models; the Macintosh IIvx and IIvi; and Macintosh Centris, Macintosh Quadra, Performa and "The power to be your best" are registered trademarks of Apple Computer, Inc. AppleScript, GeoPort, Macintosh PC Exchange, Power Macintosh, QuickTime and TrueType are trademarks of Apple Computer, Inc. PowerPC is a trademark of International

Resampling Stats 1.0

Statistics/Probability Software

PROS: Innovative, easy-to-understand statistics program; efficient programming language. **CONS:** Needs more graphics features. **COMPANY:** Resampling Stats, Inc. (703/522-2713). **LIST PRICE:** $225.

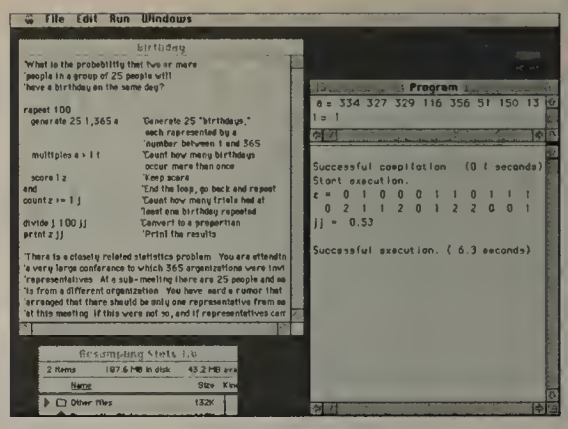
MW ★★★★

RESAMPLING STATISTICS (ALSO known in the physical sciences as the bootstrap method) is a revolutionary technique in a field that's overdue for a revolution. Many students dread taking the required statistics course. In many cases, the course starts out mildly confusing and ends up thoroughly baffling, leaving students with a repertoire of complex techniques that they often misapply.

Dr. Julian Simon, a rather controversial economist (he annoyed many environmentalist colleagues by correctly predicting that the world would in fact *not* run out of mineral resources by the early 1990s), suggested in the 1970s that computers offer a way to calculate quantities in statistics directly. Rather than produce statistics by calculating standard analytical formulas, he devised a simple simulation language that treats questions in probability and statistics as experiments.

An example of this is the solution of the notorious birthday problem. The question is, How many people do you have to poll, on average, before you find two that have the same birthday? There's a formula for computing cases such as this, but the resampling method is formula-free. The computer makes up random birthdays in a set, and records the number of trials it took to produce a match. Have the computer do this 1000 times or so, average the number of trials, and that's your answer.

In principle, any problem treated by traditional statistical methods can be treated by a resampling approach, and resampling has a conceptual advantage in that it makes no a priori assumptions about underlying distributions of the quantities involved. Resampling Stats provides a compact, BASIC-like language for programming—most problems, including the resampling versions of ANOVA and hypothesis testing, can be solved with fewer than a dozen lines of code. The program includes a tutorial and a large assortment of samples, and you can modify the samples to fit your own statistical problems.



Happy Birthday Resampling Stats calculates the chances of a repeat birthday in a group of 25 people. The same code can be modified to answer a variety of probability questions.

Resampling Stats needs to provide histograms for distributions, *x*-*y* plots, and a little more discussion of resampling methods for the *x*-*y* data sets classically treated by regression analysis. Since college statistics texts haven't quite caught up with developments in resampling, the manual should offer more detailed analysis of first-year statistics topics in resampling terms. Nonetheless, Resampling Stats is powerful, easy to use, easy to understand, and has proved itself to be a superior teaching tool in numerous classroom tests. If you have any interest in statistics, you should give this admirably straightforward approach careful consideration.—CHARLES SEITER

SerePlot 2.12

Scriptable Plotting Software

PROS: Automates batch processing of data; good set of math tools; examples of scripting cover common applications. **CONS:** Limited graphing types; a few glitches. **COMPANY:** Scientific Visions (301/593-0317). **LIST PRICE:** $135.

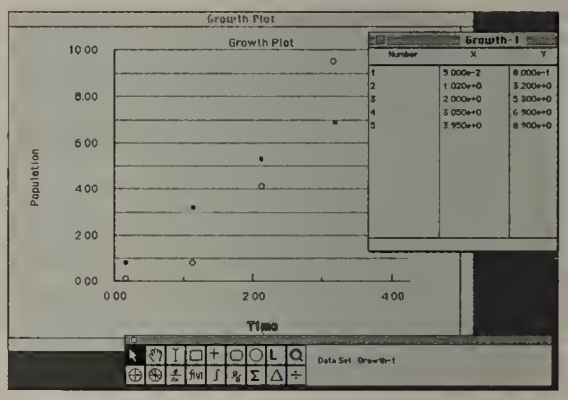
MW ★★★★

SEREPLOT IS A UNIQUE MACINTOSH charting and graphing program. It offers only the plainest two-dimensional line charts; its strength lies in its AppleScript support. For example, you can automatically load and analyze three months of stock-market data on 1000 stocks—looking for signs of statistical trends—and then print charts only for stocks that meet your preassigned criteria. In the scientific realm, you can, for example, have SerePlot sift through files of near-infrared spectra of compounds looking for maxima and minima at selected points. If you have any kind of data that can be visualized in a 2-D plot, SerePlot has the machinery to crunch it.

SerePlot's plotting facility is easy to use and lightning fast. SerePlot wants you to keep your data in tables (the choices are *X-Y*, *X-Y-DY*, and *X-Y-DX-DY*) and provides plenty of help (including sample Microsoft Excel file-conversion scripts) for getting data into Excel. The main plot dialog box shows which data tables are open, and an Objects menu specifies plot data elements. You can alter plot axes, labels, and titles, but SerePlot features such intelligent defaults and autoscaling that routine work may only need its built-in choices.

The Tool window is your introduction to SerePlot's math capabilities. Besides tools for locating *X-Y* values on your plot, this window includes a derivative tool, an integral tool, a minimax tool, and a special tool that gives statistics (mean, standard deviation) on the data between selected *x*-axis points. You can cut data from a graph and paste it into a table, and you can define your own functions using an extensive list of built-ins, ranging from the usual trig/transcendentals to error and Bessel functions. The Math menu features calculus (it generates tables of numerical derivatives and integrals), binning, smoothing, interpolating, curve fitting to arbitrary functions, and fast Fourier transforms. SerePlot performs math functions impressively fast—an order of magnitude faster than analogous functions in Excel.

And AppleScript-based batch processing is SerePlot's glory. SerePlot uses the



Pretty, Basic SerePlot's main application is repetitive generation of simple plots, with automated analysis provided by AppleScript support.

Userland Frontier dialect and includes scripts for likely chores such as importing data or specifying plot parameters. You can learn to do something useful in an hour just by studying the examples provided. Support for SerePlot exists mostly on BBSs.

Version 2.12 contains an undocumented curve-fitting feature in the Tool window and doesn't implement the documented QuickFit version of curve fitting, but the company says that these glitches will be corrected by the time you read this.

SerePlot is quick, intuitive, includes a good tutorial, and is modestly priced. If you have piles of data and don't need animated, exploding bar charts in 24-bit color, SerePlot should be part of your analysis tool kit. —CHARLES SEITER

Way to go, Apple.



Apple's new Power Macintosh™ computers are here. Based on the new PowerPC™ microprocessor, they truly have the power to change the course of computing. So congratulations, Apple. Way to go, go, go.

PowerPC Microprocessors. *A change for the better.*

MOTOROLA

©1994 Motorola, Inc. Motorola and the Ⓜ are registered trademarks of Motorola, Inc. Power Macintosh is a trademark of Apple Computer, Inc. PowerPC and the PowerPC logo are trademarks of IBM Corp. and are used by Motorola, Inc., under license from IBM Corp. All rights reserved.

Without *training*, thousands of dollars already spent on computers and software is needlessly wasted.



"...just one short-cut on your Word video saved me 20 minutes of set-up time, not to mention frustration..."

Harland Anderson - Computer Consultant

$3,800 Wasted Without TRAINING!

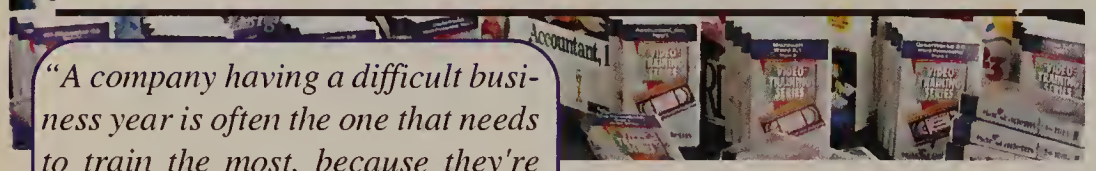


"As a result of your videos my Mac is running lean and mean..."

J. J. Johnson - San Jose, CA



$1,800 Wasted Without TRAINING!



"A company having a difficult business year is often the one that needs to train the most, because they're clearly in a competitive situation where it's even more important to elevate the skills of their people...We find the BEST RETURN ON ANY INVESTMENT COMES FROM TRAINING...your rewards go for the lifetime of the employee rather than just for the lifetime of the equipment." Tom Peters

Excellent Low Cost Training Solution

MacAcademy training videos are simple, low cost, easy-to-use and extremely effective. New users to the Mac or to a Macintosh program can master a program by watching t.v.! Each technique is described in detail with the user *seeing* each step on a Macintosh screen.

Award Winning Excellence in Training

MACWORLD Magazine readers voted MacAcademy the World Class Award for training giving MacAcademy more than twice as many votes as any other training product or company.

Guaranteed Results

Each MacAcademy Training Video carries an iron clad, money-back guarantee. If, within 30 days, you are not totally satisfied with every video you purchase from MacAcademy you may receive a full refund...no questions asked!

MacAcademy Videos Work

MacAcademy training videos have helped over 100,000 people learn new Macintosh skills. By using the videos new users can cut their learning curve by up to 75%.

To Order

To order with a credit card call 800-527-1914 Dept. MW694. Purchase orders, checks, and credit card orders may be mailed to the address listed below. Please add $3 plus $1 per video shipping and handling. FAX number is 904-677-6717, International 904-677-1918.

MacAcademy®
477 S. Nova Rd.
Ormond Beach, FL 32174

- Acius 4th Dimension (1) ☐
- Acius 4th Dimension (2) ☐
- Acius 4th Dimension (3) ☐
- Acius 4th Dimension (4) ☐
- Adobe Illustrator 3.2 (1) ☐
- Adobe Illustrator 3.2 (2) ☐
- Adobe Illustrator 3.2 (3) ☐
- Adobe Photoshop (1) ☐
- Adobe Photoshop (2) ☐
- Adobe Photoshop (3) ☐
- Adobe Photoshop (4) ☐
- Aldus Freehand (1) ☐
- Aldus Freehand (2) ☐
- Aldus Freehand (3) ☐
- Aldus Freehand (4) ☐
- Aldus PageMaker (1) ☐
- Aldus PageMaker (2) ☐
- Aldus PageMaker (3) ☐
- Aldus PageMaker (4) ☐
- Aldus Persuasion (1) ☐
- Aldus Persuasion (2) ☐
- Aldus SuperPaint (1) ☐
- Aldus SuperPaint (2) ☐
- Aldus SuperPaint (3) ☐
- Claris FileMaker Pro (1) ☐
- Claris FileMaker Pro (2) ☐
- Claris FileMaker Pro (3) ☐
- Claris FileMaker Pro (4) ☐
- Claris HyperCard (1) ☐
- Claris HyperCard (2) ☐
- Claris HyperCard (3) ☐
- Claris MacDraw Pro (1) ☐
- Claris MacDraw Pro (2) ☐
- Claris MacProject II (1) ☐
- Claris MacProject II (2) ☐
- Claris MacProject II (3) ☐
- Claris MacWrite II (1) ☐
- Claris MacWrite II (2) ☐
- ClarisWorks (1) ☐
- ClarisWorks (2) ☐
- ClarisWorks (3) ☐
- ClarisWorks (4) ☐
- Deneba Canvas (1) ☐
- Deneba Canvas (2) ☐
- Deneba Canvas (3) ☐
- Intuit Quicken (1) ☐
- Intuit Quicken (2) ☐
- Learning Macintosh (1) ☐
- Learning Macintosh (2) ☐
- Learning Macintosh (3) ☐
- Microsoft Excel (1) ☐
- Microsoft Excel (2) ☐
- Microsoft Excel (3) ☐
- Microsoft Excel (4) ☐
- Microsoft Excel (5) ☐
- Microsoft PowerPoint (1) ☐
- Microsoft Word (1) ☐
- Microsoft Word (2) ☐
- Microsoft Word (3) ☐
- Microsoft Word (4) ☐
- Microsoft Works (1) ☐
- Microsoft Works (2) ☐
- Microsoft Works (3) ☐
- Microsoft Works (4) ☐
- QuarkXPress (1) ☐
- QuarkXPress (2) ☐
- QuarkXPress (3) ☐
- Using PowerBooks (1) ☐
- Using PowerBooks (2) ☐
- WordPerfect (1) ☐
- WordPerfect (2) ☐

$49/ea.

MacAcademy Training Videos

$49/ea.

Circle 106 on reader service card

Macworld

Subscriber Courtesy Voucher

As a subscriber you are entitled to receive a full year of Macworld for almost 50% less than the annual cover price of $47.40. You save $23.40!

Please Check:

☐ 12 issues/$24. Bill me later.

Name

Company

Address

City, State, Zip

Allow 4 to 6 weeks for delivery. For Mexican and Canadian subscriptions, please add $18 per year for shipping. Add $70 annually for all other foreign countries.

Savings Statement

Annual Cover Price

$47.40

Regular Subscription Price

$30.00

Your Special Rate

$24.00

4CBK4

NO POSTAGE
NECESSARY
IF MAILED IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 1167 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

Macworld
SUBSCRIPTION DEPARTMENT
P.O. BOX 51666
BOULDER, CO 80321-1666

TrafficWatch II 2.0

AppleTalk Traffic Monitor

PROS: Supports both LocalTalk and Ethernet; Excel macro for data analysis. **CONS:** Expensive; weak support for non-AppleTalk protocols; no print capability; no alarms or triggers. **COMPANY:** Neon Software (510/283-9771). **LIST PRICE:** $495.

MW ★★

AS MAC NETWORKS MOVE FROM poky LocalTalk to sprightly Ethernet, network managers find themselves needing new monitoring tools. Neon Software's TrafficWatch II provides a host of network-monitoring capabilities for both LocalTalk and Ethernet networks, letting you get your feet wet in sophisticated monitoring even if Ethernet is still in your future.

TrafficWatch II is a single, self-contained application that comes with a Microsoft Excel macro for analyzing and printing captured statistics. The well-written manual includes useful network-measurement and tuning tips. Neon claims that this program supports all AppleTalk protocols, plus TCP/IP, NetWare, XNS, DECnet, and LAT.

For LocalTalk analysis, TrafficWatch II runs on any Mac with System 6.0.4 or later. Because it collects only statistics rather than all network traffic, the program requires only 1.5MB of memory. Of course, for Ethernet watching, you need an Ethernet adapter or a Mac with built-in Ethernet. TrafficWatch II supports all available Ethernet hardware.

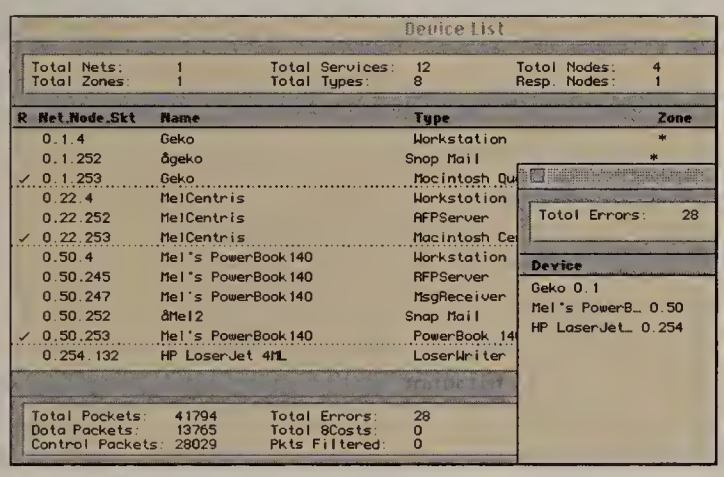
Like most network monitors, TrafficWatch II runs only on a dedicated Macintosh; the program automatically disables AppleTalk when monitoring starts and reenables it when done. At launch, TrafficWatch II scans your network and displays a list of active AppleTalk devices and zones. You then call up bar-graph displays showing network use, traffic statistics for individual nodes and protocols, and error summaries. Some graphs let you click or option-click on an individual bar to see precise values. You can configure filters for specific nodes or protocols, and you can sort statistics by any one measurement.

You can automatically save snapshots to disk at user-defined intervals and then analyze the saved statistics with the supplied Excel macro. You can also use the Excel macro to print various canned bar graphs and pie charts summarizing one or more snapshots.

Unfortunately, TrafficWatch II omits some features essential to real-world network management. Although the product claims to support numerous non-AppleTalk protocols, its actual capabilities are spotty. It groups non-AppleTalk traffic into broad categories, with no details on individual protocols such as FTP or Telnet. And it doesn't recognize non-AppleTalk devices—such as PCs or Unix systems—even though it summarizes traffic generated by those devices. You can't set triggers to start monitoring on a certain event, nor can you set alarms to alert you to problem conditions.

Finally, TrafficWatch II has got to be the first Macintosh application to produce so much output yet provide no printing facilities. It has no print command; Neon expects you to use the Excel macro to print the saved snapshot files. Worse, the manual does not document the format of these files (Neon says that such information is not available), so you're stuck with the supplied reports. Unless you are actually watching the screen when network overloads, error bursts, or similar problems occur, you must manually wade through Excel printouts to find trouble spots.

If TrafficWatch II were priced under $100, these limitations might be acceptable. But its $495 price is closer to that of full-blown network analyzers that do much more, albeit with greater complexity. The purpose of a multiprotocol network monitor is to automate the chores of day-to-day network management. Without printing, alarms, triggers, or true multiprotocol support, TrafficWatch II misses the mark.—MEL BECKMAN



Hot Charts TrafficWatch II displays network traffic statistics through interactive bar charts; clicking or option-clicking on an individual chart item displays additional data.

VIP BASIC 1.0.1

Programming Language

PROS: Great toolbox access; introduces object handling to BASIC; fast interpreter. **CONS:** No easy way to compile programs. **COMPANY:** Mainstay (805/484-9400). **LIST PRICE:** $295.

MW ★★★

BASIC HAS SURVIVED MAINLY BEcause it's significantly easier to learn than other languages. For the Mac, Microsoft offers QuickBASIC, and another product with a loyal developer following is Zedcor's FutureBASIC (see *Reviews*, *Macworld*, July 1993). Mainstay is now offering an applications-creation environment for BASIC that has the same scope as its highly regarded VIP C.

Like VIP C, VIP BASIC (VIP stands for visual interactive programming) uses a skeleton application called Dispatcher. VIP Dispatcher creates an event loop, which is the heart of every Mac program, and provides a simple structure to scan for and respond to Mac keyboard and mouse events. As in VIP C, you can add the actual application code to this structure in browserlike windows containing source code, variables, constants, and macros. There are essentially two ways to use VIP BASIC to speed up coding. First, you can familiarize yourself with the VIP programming-icon set and then string together icons for a flowchart version of your code that VIP BASIC translates into source code. The second way is to browse for toolbox routines and commands, and cut and paste together your own source code. Both of these approaches reduce the number of small errors that always seem to occur when you type page after page of code.

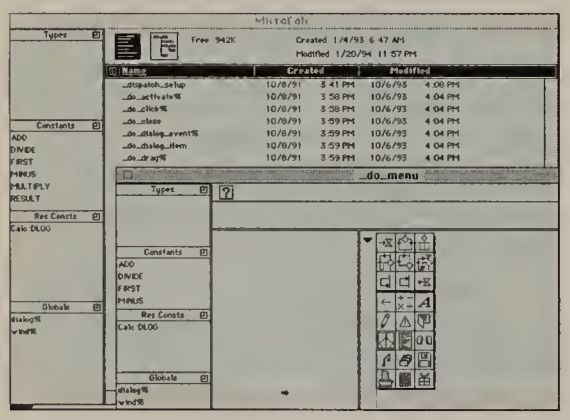
The other features of the VIP environment are also quite creditable. The interpreter is fast, which means that the run-time module is a workable method of distributing small programs. (The run-time module itself takes a bit more than 200K, and VIP BASIC programs usually require some trimming with the included PackMover utility.) The debugger, identical to VIP C's, is adequate—since VIP BASIC is interpreted, not compiled, the debugging requirements are less stringent. Mainstay includes examples for menus and dialog boxes and provides subprograms that let you program one level up from toolbox calls. The documentation and tutorial are the best available for a Mac BASIC product. Finally, an

continues

Apple-events link to Symantec's Think Reference provides instant Mac-feature documentation (assuming you have a copy of Think Reference).

Two key points, however, make this product less valuable than VIP C. The source code generated in VIP C can be compiled without much modification either by the Think C or MPW C compiler. There's no corresponding compilation route in BASIC. If you use a minimal set of BASIC keywords, you can export a VIP BASIC project to QuickBASIC and compile the code, but it isn't easy to do an impressive application using this method. I had no success in compiling VIP BASIC projects under FutureBASIC—a disappointing result, since FutureBASIC produces smaller, faster compiled code than QuickBASIC.

The other drawback has to do with the wisdom of using BASIC for large-scale Mac programming. In the VIP approach, BASIC is treated as an alternative to C—throughout large patches of VIP BASIC documentation, C keywords have simply been replaced with BASIC keywords, and the sample programs are equivalent in both products. Given that most of the code in a typical Mac program deals with interface management rather than computation, BASIC programmers should just bite the bullet, learn a minimal version of C, and work in VIP C with a view toward compiling programs easily. If you insist on using BASIC, the combination of FutureBASIC and Staz Software's PG:PRO is simpler to use and produces respectable compiled code.



BASIC through Pictures You can program in text or by linking icons from the palette. In any window you can switch back and forth between text and a flowchart view based on the icons.

Nonetheless, VIP BASIC is a popular product because it lets programmers who know only BASIC get started producing real, if interpreted, Mac programs. If your background is in BASIC and you want to learn the Mac Toolbox, VIP BASIC is an excellent choice; as a serious developer's tool, it's not on the same footing, despite its considerable virtues, as Mainstay's VIP C.—CHARLES SEITER

Managing Your Money 6.0

Personal-Finance Program

PROS: Good tax-planning and investment features. **CONS:** Data entry can be a chore; technical support is hard to reach. **COMPANY:** Meca Software (800/820-7457). **LIST PRICE:** $79.95.

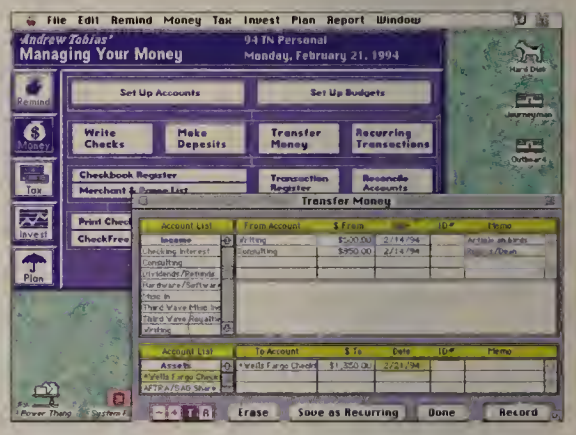
MW ★★★

MECA SOFTWARE'S MANAGING YOUR Money (MYM) 6.0 is a good program for managing your personal finances, but overall it fails to topple the market leader, Intuit's Quicken 4.0. People who need extensive tax-planning and investment-tracking features should give MYM serious consideration, however. New to version 6.0 are updates for the 1993 tax code, new printed-check formats, financial-report customization features, and security-price updates via CompuServe.

Ease of data entry is important with financial programs, and MYM comes up short. On the plus side, when you choose one of the five tools—Remind, Money, Tax, Invest, and Plan—MYM's navigation palette, a flowchartlike diagram shows the tool's functions. But, unlike Quicken and Survivor Software's MacMoney, MYM doesn't let you enter all of your transactions on one screen. Within the Money tool, there are separate screens for writing checks, making deposits, and transferring money. You enter a check in the Write Checks screen by using the mouse to select from a pop-up menu the account from which you're drawing funds, then type in the information about payee and expense categories. (Having to take your hands off the keyboard gets quite annoying.) To enter an ATM withdrawal (which other programs handle as if it were a check), you use the Transfer Money screen to specify the account the money is coming from (for example, a checking account) and the expense categories on which you spent the money.

Another frustrating thing about MYM is that you must remember to use different screens for different cases of the same transaction type. The Make Deposits screen can handle only one income category per deposit, so if you make deposits that you want to allocate to different income sources, you have to use the Transfer Money screen.

MYM really stands out in its depth of tax-planning and investment features, however. You're encouraged (but not required) to assign each expense category to a tax category corresponding to the IRS's 1040 form or schedules A through F. Using the Tax tool, you can then estimate your tax liability at any time and print out reports of your tax position or perform "what-if" analyses. It exports data in TXF format to Meca's companion tax program, Andrew Tobias' TaxCut, or to Chipsoft's MacInTax, and it handles investments exhaustively through the Invest tool, which lets you track stocks and bonds, options, mutual funds, and other securities. MYM handles financial portfolios linked to cash-management accounts, and it tracks IRA positions.



Navigation and Entry Selecting the money tool from MYM's navigation screen yields the Transfer Money screen for tracking a deposit with multiple income sources.

But MYM needs better technical support. Over the course of this review, I made many (toll) calls, and all I got were busy signals; I never did get through to Meca's support. Sending a fax with my questions provided a slightly better response: I sent the fax on a Wednesday and got an accurate faxed reply the following Monday. The best support response came when I posted questions on Meca's CompuServe support forum; I received overnight replies that were complete and concise. Meca does offer a support plan ($49.95 per year) that provides access to priority support lines with extended hours, a free annual upgrade of MYM, and other benefits; but Meca clearly needs to improve the level of its free support.

Managing Your Money 6.0 does a good if somewhat roundabout job of tracking your total financial picture. MYM isn't as easy to use as Quicken or MacMoney, but it excels in tax, investment, and financial planning, with features that beat any of the competition. If these areas are important to you, then MYM is your best bet. But if you just need an electronic checkbook, you might be more satisfied with another program.
—TOM NEGRINO

From Newtons to PIMs,

Since 1984,

the original Macintosh mail-order source. Over 3500 products.
★ denotes Money Back Guarantees.

HOURS:
8 a.m. Monday continuous thru 5 p.m. Sunday ET



Apple Computer

1332 *Newton MessagePad 110*—The second generation is here! Sleeker, more compact; better handwriting recognition; longer battery life; more memory. Weighs just 1.28 pounds.

$599.



Call for our latest catalogs.



CREATIVE THINK

14540 *Creative Whack Pack*—Improve your creative thinking! Interactive software designed to open mental blocks, gain insight into your own creative thinking, and establish methods for encouraging innovative ideas. Includes best-selling book, *A Whack on the Side of the Head.* **$29.**

POWERBOOK/NEWTON

Apple Computer
1332 MessagePad 110 ..... $599.95
★ **Applied Engineering ... 30 day MBG**
8799 Auto Adapt 69. 8800 Batt. Charger .... 67.
ASD Software
15864 Wiz Tools for PowerBook 59.95
★ **Battery Tech., Inc. ... 30 day MBG**
7562 140-180 Batt. 59.95 10392 Charg. 64.95
★ **Connectix ... 30 day MBG**
8441 CPU 2.0 ..... 55.
★ **Global Village ... 30 day MBG**
7720 PowerPort/Silver 269. 7710 /Gold 299.
★ **I/O Design Cases ... 30 day MBG**
8121 PowerBook SL..... 47.95 8113 EX.. 59.
★ **Kensington Cases ... 30 day MBG**
14018 NoteBook 35.95 9585 Executive 115.
Lind Electronic Design
14587 SBC-2 139. 14841 BL4-200..... 179.95
★ **Sophisticated Circuits ... 30 day MBG**
7419 PowerPad Granite w/QuicKeys ..... 109.
7425 *(granite)* 69.95 7057 *(platinum)* 69.95
★ **Targus Cases ... 60 day MBG**
11207 Leath. PB Case 95. 1305 Universal ... 69.
Technoggin, Inc. ... 30 day MBG
14014 PowerPlate 3X 219.95 14015 5X 279.95
14013 PowerPlate Mini 3 ..... 154.95
U.S. Robotics
11841 WorldPort 14.4 Fax ..... 269.
★ **VST ... 30 day MBG**
2634 ThinkPack Complete 189.95
2636 ThinkPack Plus 269.95
★ **Zoom Telephonics ... 30 day MBG**
10267 FaxModem PBK144 ..... 199.95

DAILY BUSINESS

Abacus Concepts
7106 StatView 4.01 ..... 439.
★ **Aldus ... 30 day MBG**
11558 TouchBase or 11557 DateBk. Pro *ea.* 49.
11559 TouchBase Pro/DateBook Pro 89.95
★ **Attain Corporation ... 60 day MBG**
8465 In Control 85. 11545 w/Dynodex 99.95
★ **Best! Ware ... 30 day MBG**
14187 M.Y.O.B. 55. 14188 w/Payroll ... 109.95
★ **Cambridge Sci. Comp. ... 30 day MBG**
15014 ChemDffice Plus 2.0 ..... 1199.
★ **CheckMark ... 60 day MBG**
5863 Multiledger 229. 5862 Payroll..... 169.
★ **Claris ... 30 day MBG**
3903 ClarisWorks 2.1 for Mac 199.95
3836 FileMaker Pro 265. 14732 MWrite Pro 95.
Creative Think
14540 Creative Whack Pack ..... 29.
★ **DeltaPoint ... 30 day MBG**
12974 DeltaGraph Pro 3 ..... 139.95
15819 DeltaGraph Pro 3 Comp. Upgrd. ... 79.95
Gold Disk
12279 Astound ..... 249.
★ **Inspiration ... 30 day MBG**
11269 Inspiration 4.0 ..... 165.95
★ **Intuit ... 30 day MBG**
11845 Quicken 4.0 ..... 39.95
★ **Lotus Development ... 60 day MBG**
11580 Spec.: 1-2-3 Mac & DeltaGraph Pro $107.
★ **MECA ... 60 day MBG**
2796 Managing Your Money 6.0 ..... 35.
★ **Microsoft ... 30 day MBG**
2884 Works 3.0 155. 4902 Word 5.1 ..... 295.
3669 Excel 4.0 295. 5454 MS Dffice 3.0 475.
★ **Now Software ... 30 day MBG**
1793 Now Up-to-Date 65. 2366 *(10 pk.)* 519.
14027 Now Up-to-Date & Now Contact ... 99.95
★ **Palo Alto ... 60 day MBG**
6975 Bus. Plan 75. 4690 Mkt. Plan Tlk. 75.
★ **Paradygn Concepts ... 30 day MBG**
15001 HomeWorks ClarisWorks 37.95
14978 HomeWorks MS Works 37.95
★ **ProVUE ... 60 day MBG**
4582 Panorama 249. 11540 PowerTeam 95.
★ **Symantec ... 60 day MBG**
7636 ACT! ..... 169.
★ **WordPerfect ... 30 day MBG**
4268 WordPerf. 3.0 299.95 4711 Upgd. 74.95

GRAPHICS & DESIGN

★ **Abracadata, Ltd. ... 30 day MBG**
12083 Design Your Own Railroad 39.95
Architect., Interiors or Landscape *ea.* 49.95
Adobe
4145 Adobe Premiere 3.0 ..... 449.95
12435 Illustr. 389.95 12886 Photoshop 549.95
★ **Aldus ... 30 day MBG**
13711 Home Publisher 2.0.1 ..... 44.95
11548 PageMaker 579.95 10864 Upgrd. 145.95
15021 Aldus Persuasion 3.0 ..... 324.95
1330 FreeHand 389.95 4728 Upgrd. 145.95
1306 Aldus Paint & Publish Bundle 84.95
Altsys
1195 Fontographer 258.95
★ **Apple Computer ... 30 day MBG**
3008 Apple Font Pack 45.95
Broderbund Software
13603 Print Shop Deluxe 49. 3572 Kid Pix 34.
★ **Claris ... 30 day MBG**
14158 Impact or 2518 MacDraw Pro *ea.*..... 269.
★ **Deneba Software ... 30 day MBG**
11055 artWDRKS 99. 3227 Canvas 3.5 259.
Fractal Design
10402 Painter 2.0A 265. 1564 PainterX2 94.95
Gryphon
4202 Morph 2.0 ..... 154.95
★ **Harvard Systems Corp. ... 30 day MBG**
11193 Kai's Power Tools for Photoshop 119.95
Imageline, Inc.
14438 Super Bundle EPS 94.95
14457 Value Pak 1 EPS 64.95
14444 Dffice Clips EPS 25.95
★ **Manhattan Graphics ... 30 day MBG**
4990 Ready,Set,Go! 6.0 ..... 219.95
Quark
7612 QuarkXPress 3.2 ..... 589.95
★ **Ray Dream ... 30 day MBG**
12264 JAG II..... 89. 4761 Designer 3.0 249.
SoftMaker, Inc.
10556 Infini Type Plus 52.95
★ **T/Maker ... 30 day MBG**
ClickArt *(bitmapped)* 34.95 *(EPS)* 55.95
3144 Incred. Images or 3147 CD-RDM *ea.* 89.95
Virtus
3185 WalkThrough Pro 249.95
3189 Virtus VR 64.95

PROGRAMMING/UTILITIES

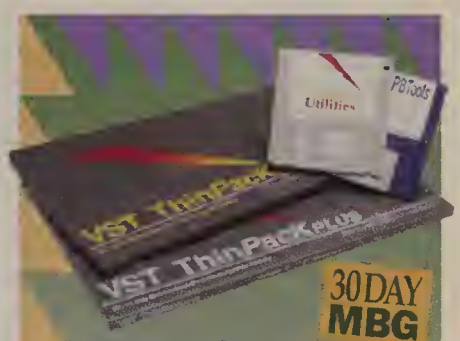
★ **Abbott Systems ... 30 day MBG**
5236 CanDpener 2.0 59. 9578 Kaleidoscope 25.
★ **Aladdin Systems ... 30 day MOG**
7410 StuffIt SpaceSav. 34.95 6740 Deluxe 69.



Aldus Corp.

Get professional design, illustration, and production tools in one powerful program, with *Aldus FreeHand 4.0*. Create impactful presentations with *Aldus Persuasion 3.0*, combining powerful charting, formatting, and multimedia tools.

1330 *Aldus FreeHand 4.0* **$389.95**
15021 *Aldus Persuasion 3.0* 324.95



VST Power Systems

Run your PowerBook for 5 to 9 hours with the *ThinPack Complete*. Includes ThinPack rechargeable battery, utilities software, cable, and more. *ThinPack Plus* packs twice the power! Ideal for color PowerBook users.

2634 *VST ThinPack Complete* **$189.95**
2636 *VST ThinPack Plus* 269.95



Altsys **$258.95**

1195 *Fontographer*—Create professional-quality PostScript and TrueType fonts with ease. Modify existing type or create your own with a palette of precise tools. Trace characters, or rotate, scale, or skew them.



Aldus Consumer

1306 *Aldus Paint & Publish Bundle*—Includes *SuperPaint 3.5* and *Home Publisher 2.0*. Here's all the tools you need to draw, paint, write, design, and publish everything from greeting cards to brochures. Easy to learn, fun to use. **$84.95**

MacConnection®

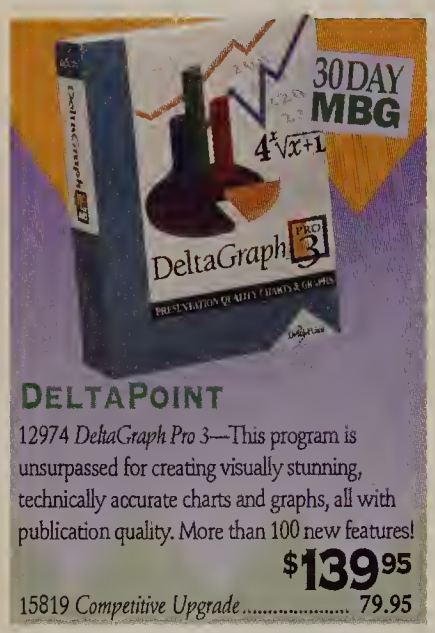
800-800-3333

694MW

MEMBER DIRECT MARKETING ASSOCIATION

14 Mill Street, Marlow, NH 03456
SALES 603-446-3333 **FAX** 603-446-7791

CD-ROMs to Modems,

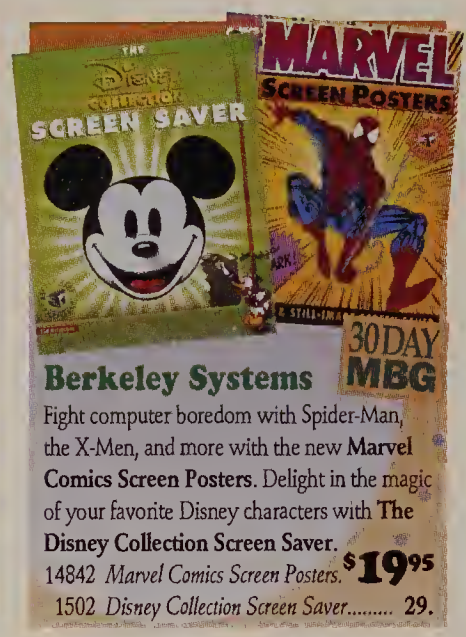


DELTAPOINT

12974 *DeltaGraph Pro 3*—This program is unsurpassed for creating visually stunning, technically accurate charts and graphs, all with publication quality. More than 100 new features!

$139.95

15819 *Competitive Upgrade* 79.95



Berkeley Systems

Fight computer boredom with Spider-Man, the X-Men, and more with the new **Marvel Comics Screen Posters**. Delight in the magic of your favorite Disney characters with **The Disney Collection Screen Saver.**

$19.95

14842 *Marvel Comics Screen Posters.*
1502 *Disney Collection Screen Saver*..... 29.



DANTZ DEVELOPMENT

7945 *Retrospect Remote 2.0*—Powerful Mac network backup software. For automatic, centralized backup and archiving. Supports compression, encryption, & verification. **$259.**

3393 *DiskFit Pro 1.1*—A fast and efficient data backup solution ..... 72.



NOW SOFTWARE

14027 *Now Up-to-Date & Now Contact*—Integrated scheduling and contact management; includes reminders, to-do lists, word processing, and instant access to your contacts and events. 1993 *MacUser* Eddy Award winner.

$99.95

★ **Apple Computer ... 30 day MBG**
1206 At Ease $45.95 7072 QuickTime Kit $105.
1074 System 7.1 59.95 13047 S7 Pro.. 99.95
10478 System 7.1/Font Pack Bundle ..... 62.

ASD Software
15865 ASD Security Trio: FileGuard/TrashGuard/FileDuo 149.95

★ **Berkeley Systems ... 30 day MBG**
5737 After Dark 2.0x *(30+ screens!)*..... 29.
2198 More After Dark 25. 2196 Bundle 39.95
1502 The Disney Collection Screen Saver.. 29.
3392 Star Trek 29. 14842 Marvel Comics 19.95

Bit Jugglers, Inc.
14676 Underware 29.95

★ **CE Software ... 60 day MBG**
1727 CalendarMaker 39. 7927 QuicKeys 105.

★ **Central Point ... 30 day MBG**
5041 MacTools 3.0 85.95 11812 Upgd. 99.95

★ **Connectix ... 30 day MBG**
14789 RAM Doubler or 10765 Virtual *ea.* 55.

★ **Dantz Development ... 30 day MBG**
9115 DiskFit Direct 1.0 29. 3393 Pro.... 72.
5255 Retrospect 145. 7945 Remote 2.0 259.

★ **Datawatch ... 30 day MBG**
4803 Virex 5.0 65. 11486 SuperSet Util.. 94.95

★ **Dayna Comm. ... 60 day MBG**
15773 Profiles 1.0 ..... 79.95

FWB, Inc.
2999 Hard Disk ToolKit 125. 7929 Pers.. 49.
1165 RAID Toolkit..... 639.

★ **Golden Triangle ... 30 day MBG**
11731 TimesTwo *(1.44)*..... 85.

★ **Inline Software ... 30 day MBG**
15849 Pop-Up-Folder 34.95
15850 TimesSquare..... 49.95
7068 INITPicker or 1740 Redux Deluxe .. 49.95

★ **Kent Marsh Ltd. ... 30 day MBG**
9513 FolderBolt 73. 1839 NightWatch II. 89.

Metrowerks, Inc.
15444 CodeWarrior Bronze..... 199.

MicroMat Computer Systems
3732 MacEKG II... 89. 2998 DriveTech.... 42.

★ **Now Software ... 30 day MBG**
12303 Now Compress 46. 12304 FUN!.... 29.95
6925 Now Utilities 4.0 ..... 84.

★ **Symantec ... 60 day MBG**
3955 Suitcase 53. 14244 SuperDoubler 79.95
5176 SAM..... 65. 6748 NUM..... 95.

LEARN & PLAY

Broderbund
13601 The Treehouse ..... 36.

★ **Davidson & Associates ... 30 day MBG**
2574 MathBlast. Plus or 1076 Zoo Keep. *ea.* 34.
14848 Cruncher ..... 34.

★ **Delta Tao ... 30 day MBG**
13714 Eric's Ultimate Solitaire 36.95

★ **Edmark Corporation ... 30 day MBG**
7155 Kid Desk 24. 7318 Millie's Math Hse. 29.
1078 Bailey's Book House..... 29.
12989 Thinkin' Things ..... 39.

Electronic Arts
1907 PGA Golf 38.95 2805 Tour. Course 18.95

GameTek
13813 Jeopardy or 7433 Wheel of Fortune 24.95

★ **Great Wave ... 30 day MBG**
6693 KidsMath or 2276 Kid's Time Dlx $27.95

★ **Inline Software ... 30 day MBG**
11188 Pax Imperia..... 36.95
9792 Deliverance or 9797 Firefall Arcade 29.95

Interplay Productions
1615 Mario Teaches Typing..... 29.95
Bridge Dlx or Out Of This World *ea.* 34.95

★ **Leister Productions ... 30 day MBG**
7126 Reunion 3.0 ..... 115.

★ **Maxis ... 30 day MBG**
13818 SimCity 2000 39.95 5279 Classic 24.95

★ **MECC ... 30 day MBG**
3959 Word Munch 19. 3963 Oregon Trail 29.

★ **Microsoft ... 30 day MBG**
2868 Flight Simulator 4.0 *(CP)*..... 42.
14214 Creative Writer 42.95

Nordic Software
7723 Lang. Explorer or 7767 ClockShop *ea.* 29.
8260 Word Quest or 7470 Jungle Quest *ea.* 30.

Software Toolworks
15815 Miracle Piano Software 84.95
5201 The Miracle Piano System..... 269.95

★ **StarPlay Productions ... 30 day MBG**
3675 Crystal Caliburn..... 33.95

Upstill Software
14140 Mangia 33.95

Voudette
4764 FLOWERscape ..... 48.

VIDEO AND SOUND

Coda Music Technology
5604 Finale 3.0 549. 12307 Fin. Allegro. 259.

★ **Great Wave ... 30 day MBG**
1014 ConcertWare Pro 1.0..... 175.

Macromedia
7651 Action! 219.95. 5087 Director 3.1 849.95

Nova Development
11101 Kaboom! 29. 12278 w/More Kaboom 40.

Radius
1738 PrecisionColor Pivot *(req. interface)* 899.95
14597 PhotoBooster..... 799.95

RasterOps PaintBoard Series
14750 Lightning 849.95 12909 Turbo XL 1199.

Sony Multiscan Trinitron Monitors
10529 CPD-1730 17" ..... 1099.

★ **SuperMac/E-Machines ... 30 day MBG**
12704 20"+Color 1849. 10321 Col.Pg. T16II 1299.
10322 Presenter or 8028 Futura IISX... *ea.* 469
8005 Ultura LX 1199. 7985 EtherDock. 649.
15087 Simply TV 419.95



Inline Software

15849 *Pop-up-Folder*—Find and save files without clicking on folder after folder! New software lets you easily navigate through your hard disk by hierarchically displaying the contents of all folders and subfolders.

$34.95



We have memory for every Macintosh.
Please call for the best pricing!



ABACUS CONCEPTS

7106 *StatView 4.01*—The statistical analysis package that gives you complete, descriptive statistics for continuous and nominal variables. Offers a variety of presentation formats for great-looking tables and graphs. Output is hot-linked to data. **$439.**



MOBIUS TECHNOLOGIES

15189 *Speedster 040 Accelerator 33MHz w/o FPU*—Plug-in Quadra performance for your current Mac. An instant speed boost of up to 700%! You also get a FREE 128K Cache for even faster acceleration! Supports Mac IIx, IIcx, IIsi, and IIci. **$579.95**

15191 *33MHz w/FPU* 779.95
15190 *40MHz w/FPU*..... 1149.

OUR POLICY

- VISA, MASTERCARD, AMEX. No surcharge.
- Your credit card is not charged until we ship.
- If we must ship a partial order, we pay freight on shipment(s) that complete the order (in U.S.).
- No sales tax, except OH (please add applicable tax).
- All U.S. shipments insured; no additional charge.
- APO/FPO orders shipped First Class Mail.
- International orders: U.S. $100 minimum, add 2% surcharge and $2.30 insurance. Manufacturer support and upgrade eligibility may be limited outside the U.S.A. Some products not available for export, call or fax information.
- COD maximum $1000. Cash or certified check. COD orders require an additional $4.50 charge, ship via UPS and may require addt'l UPS charges.
- 120 day limited warranty on all products. Defective software replaced immediately. Defective hardware repaired or replaced at our discretion. All items subject to availability. Prices and promotions subject to change without notice.
- We are not responsible for typographical errors.

SHIPPING

Continental U.S.: Total shipping charge on any order is $3. Barring events beyond our control, all credit card orders (no CODs) phoned in weekdays by 3:15 a.m. ET will ship Airborne Express for delivery the next business day. That's *same day* delivery for orders placed between midnight and 3:15 a.m.! (Some orders ship UPS Ground for next day delivery). Saturday delivery available to many areas upon request at no additional charge. Order all day Saturday thru noon Sunday for Monday delivery. Some areas required an extra day delivery.

Hawaii, Alaska, Canada, Puerto Rico & U.S. Virgin Islands: Shipping may req. additional time/charges.

All other areas: Please call 603-446-3333 or FAX 603-446-7791 for information. Business offices: 603-446-7711 M-F 9 a.m. to 5:30 p.m. ET.

We're Your Source.



CAERE New lower pricing!

7925 *OmniScan*—Caere's OmniScan is a handheld scanning solution with integrated OCR *(OmniPage Direct)*, image-editing *(Image Assistant 65)* & recognition capabilities *(FaxMaster)* in a convenient package.

$299.95



$60 rebate on BOTH through June!

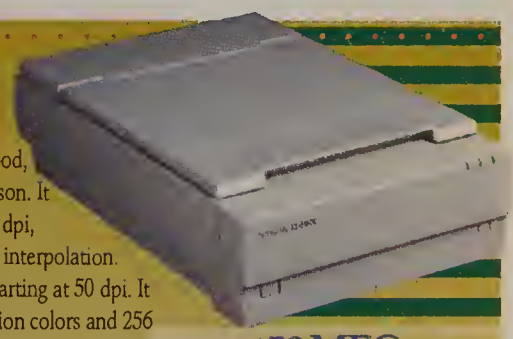
30 DAY MBG

Texas Instruments

13658 *TI microLaser Pro 600 PS23*—Photo-quality, 600 dpi with 8ppm RISC power. 500-sheet capacity, 6MB, Adobe PostScript level 2 w/23 fonts, PCL5, Mac/PC ready. **$1399.**

13659 *microLaser Pro 600 PS65* ..... **1599.**

EPSON AMERICA



8219 *ES-800C Pro-Mac Flatbed Color Scanner*—If scanning is your livelihood, get the ES-800C Pro-Mac from Epson. It offers an optical resolution of 400 dpi, enhanced to 800 dpi with software interpolation. Choose from 23 levels of resolution, starting at 50 dpi. It scans in 24-bit color and reads 16.7 million colors and 256 shades of gray. Image-enhancement features include three halftoning modes, seven brightness levels, sharpness and contrast options, and red, green, and blue tone-curve graphs. You also get color- and gamma-correction controls. It comes with the full version of *Adobe Photoshop 2.5*, *Kai's Power Tools*, and *Scantastic PIM & DA*. The ES-800C Pro is a *PC Computing* Best 200 Hardware Products Category Winner for 1993; *Macworld* (8/93) called it "full-featured and easy-to-use."

$50 MFG rebate & FREE Astound by Gold Disk!

Offer good from 5/1/94 to 7/31/94.

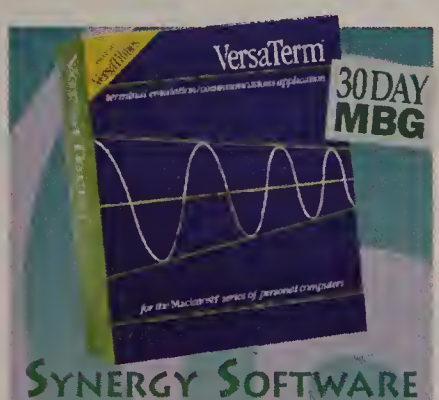
$1379.95



CommForce

15862 *4-Sight*—A simple but powerful faxing solution for up to 10 networked Macs. Schedule automatic faxing, transmit multiple documents to multiple locations, and more. Includes FaxModem.

$599.95



SYNERGY SOFTWARE

6618 *VersaTerm*—Make the most of your on-line sessions. Offers high-quality terminal emulations, TCP/IP network connections, and a graphical interface with mail, news, directory, and file transfers for Internet communications.

$119.95

CD-ROM

★ **Claris Clear Choice ... 30 day MBG**
13907 From Alice To Ocean *(book w/CD)* $46.95
Broderbund
13600 The Tortoise and the Hare ..... 34.
13602 The New Kid on the Block ..... 34.
FWB, Inc.
10198 CD ToolKit ..... 49.
★ **Microsoft ... 30 day MBG**
1741 Musical Instruments on CD-ROM 54.95
14913 Art Gallery on CD-ROM 54.95
14914 Dinosaurs on CD-ROM 54.95
PhotoDisc, Inc.
Full line of great CD-ROM images ..... call
★ **Presto Studios ... 30 day MBG**
11330 The Journeyman Project 44.95
Software Toolworks
12968 The Animals! 54.95
★ **Spectrum Holobyte ... 30 day MBG**
1485 Iron Helix 59.95
Time Warner
7454 Hell Cab 1.0 *(CD-ROM)* 64.95

COMMUNICATIONS

★ **Apple Computer ... 30 day MBG**
7073 Mac PC Exchange ..... $59.
10453 AppleShare 4.0 1469. 14576 Upgd. 539.
7101 AppleTalk Remote Access 1.0 ..... 149.
14231 Remote Access 2.0 Client for Mac 54.95
Asanté Technologies, Inc.
Asanté Lite Ethernet Cards ..... call
2775 10/T Hub-8 249. 2772 10/T Hub-12 499.
BOCA Research
11052 M144I V.32bis FaxModem 159.95
Coactive Connectors
1184 Mac... 29.95 1189 Mac to PC... 159.95
CommForce
15862 4-Sight 599.95
★ **CompuServe ... 60 day MBG**
1676 Membership Kit ..... 25.
1673 Navigator 3.2 ..... 49.
★ **DataViz ... 60 day MBG**
1823 MacLink Plus/PC Connect 7.5 ..... 129.
12613 MacLink Plus/Easy Open Translators. 69.
12093 MacLink Plus/Translators Pro 7.5 ..... 95.
★ **Dayna ... 60 day MBG**
11878 DOS Mounter Plus $54.95
8719 EtherPr. or 9888 *(10BASE-T) ea.* 339.95
★ **Delrina Technology ... 60 day MBG**
10080 FaxPRO for Macintosh 1.5 ..... 79.95
★ **Farallon Computing ... 30 day MBG**
11696 Etherthin Mac/PB ..... 309.
11499 EtherWave AAUI Transceiver ..... 109.
4869 PhoneNET Connector 10-Pk *(DIN8)* 195.
14545 Timbuktu Pro 135. 4866 Remote 129.
9516 PowerPath 105. 9518 LocalPath. 139.
6922 Replica/Mac 69.95 7407 *(10 user)* 499.95
★ **Freesoft ... 30 day MBG**
6115 White Knight 11 ..... 85.
14804 Second Sight 119.95
★ **Global Village ... 30 day MBG**
7889 TelePort/Bronze II 95. 2179 Gold 299.
Hayes
10822 ACCURA 2400 74.95 11422 96 Fax 159.95
11419 ACCURA 144+Fax144 ..... 169.95
2300 Smartcom II 84.95 5971 OPTIMA 24 119.
Insignia Solutions
7557 AccessPC 3.0 ..... 85.
4089 SoftPC... 109. 10554 SoftPC Pro... 215.
★ **Practical Peripherals ... 30 day MBG**
8063 PM14400FX FaxModem 429.95
11045 PM14400FXMT FaxModem 209.95
★ **Shiva ... 30 day MBG**
6555 LanRover/L ..... 599.
14837 NetModem/E ..... *ea.* 1479.
★ **Software Ventures ... 30 day MBG**
1964 MicroPhone II 109. 3455 Pro 139.95
Sonic Systems
Ethernet Adapters ..... call
★ **STF Technologies ... 30 day MBG**
7639 FaxSTF 3.0 ..... 39.95
SupraFAXModems
11223 V.32bis 14400 ..... 234.95
5337 14400LC 164.95
★ **Synergy ... 30 day MBG**
6618 VersaTerm 5.0 ..... 119.95
6619 VersaTerm 5.0 PRO 169.95
Technology Works
1582 GraceLAN ..... 449.
U.S. Robotics
11842 Sportster 14.4 Mac & Fax ..... 229.
★ **Zoom Telephonics ... 30 day MBG**
7757 FaxModem AFX 69.95
3553 FaxModem VFX V.32bis 164.95
14152 FaxModem VFX 14.4V for Mac..... 174.95
15895 FaxModem VFX 28.8 ..... 239.95

UPGRADES & DRIVES

★ **Applied Engineering ... 30 day MBG**
8361 1.44MB HD Drv. 229. 5290 Pls. Drv. 299.
10282 TransWarp 4300 *(40MHz, no FPU)*. 399.
★ **DayStar Digital ... 30 day MBG**
11987 FC 040 *(Quadra 700, 800, 900, 950)* 319.95
12695 040 40MHz 1099.95 1302 33MHz 799.95
1670 PowerCache 50MHz *(no FPU)*..... 459.95
FWB, Inc.
9529 PocketHammer 170 ..... 459.95
14322 PE 340 FMF 579.95
14318 PocketHammer1000FMF 1349.95
IOMEGA
6499 90MB Transp. *(reqs. interface)* $479.95
2467 90MB Gold Std. Rem. Cart. *(3)* 289.95
8781 Mac Transportable 90 PRO 369.95
10499 Transportable MultiDisk 150 ..... 479.
★ **MDS Drives ... 30 day MBG**
15097 44MB SyQuest *(drive only)*..... 239.95
8141 44MB SyQuest *(with cartridge)*... 299.95
15802 88MB SyQuest *(drive only)*..... 299.95
8125 88MB SyQuest *(with cartridge)*... 389.95
Mobius Speedster 040 Accelerators
15189 AC433i 33MHz w/128K Cache 579.95
15191 AC433f 33MHz FPU w/128K Cache 779.95
15190 AC440f 40MHz FPU w/128K Cache 1149.
Peripheral Land (PLI) full line available
11470 Infinity 88/RW 44 ..... 549.

INPUT/OUTPUT

Advanced Gravis
1482 Game Pad 39. 9963 MouseStick II 69.
Caere
4930 OmniPage Pro 489. 7705 Direct ... 189.
7925 OmniScan 299.95
CoStar
1885 Stingray ADB 63.95
★ **Datadesk ... 30 day MBG**
9830 MAC101E 129. 2384 w/QuicKeys 159.
Epson
8194 Action Scanner *(ES-600C SCSI)* 879.95
8219 ES-800C Pro Mac 1379.95
★ **GDT Softworks ... 30 day MBG**
2499 PowerPrint 99.95 12717 PP. NW 329.95
Hewlett-Packard LaserJets
14689 MacScan Jet 999.95 4312 4ML 1069.95
Interex Computer Products
12862 105 Key Deluxe Keyboard ..... 99.
★ **Kensington ... 30 day MBG**
2547 Turbo Mouse 4.0 ADB ..... 107.
Key Tronics
6974 Mac Pro+Keybd 135. 1070 TrakPro 219.
★ **Microtek Labs, Inc. ... 30 day MBG**
13815 ScanM. IIG 499.95 13814 IISP 779.95
★ **Mouse Systems ... 30 day MBG**
7520 Litt. Mouse ADB or 8001 Plus *ea.* 69.95
★ **Soph. Circuits ... 30 day MBG**
8009 PowerKey 75. 8008 Remote.... 32.
★ **TI microLaser Pro 600 ... 30 day MBG**
13658 microLaser Pro 600 PS23 ..... 1399.
13659 microLaser Pro 600 PS65 ..... 1599.
UMAX
13748 UC630 719.95 13751 UC1260 1469.95

ACCESSORIES

Apple Computer
11663 StyleWrit. II Cart. 23. 11669 *(3 pk.)* 63.
LaserWriter Toners: Pers. 65. LW II 85.
Disks/Carts.: BASF, Fuji, 3M, Sony
★ **I/O Design Cases ... 30 day MBG**
8812 Ultimate Class. 62.95 1941 Ult. LC 89.95
13549 PowerBook Leather Satchel *(black)* 77.95
★ **Targus Cases... 60 day MBG**
7369 Notepac 35.95
13941 Business Commuter Case 114.95

MacConnection®

800-800-3333

694MW

MEMBER DIRECT MARKETING ASSOCIATION

14 Mill Street, Marlow, NH 03456

SALES 603-446-3333 **FAX** 603-446-7791

© Copyright 1994 PC Connection, Inc. MacConnection is a division and registered trademark of PC Connection, Inc., Marlow, NH. MacTV is a trademark of PC Connection, Inc.

WHERE WERE YOU THE LAST TIME NORTON UPDATED THEIR SOFTWARE?



©1994 Central Point Software. Central Point and MacTools are trademarks of Central Point Software. All other products names are trademarks of their respective holders.

It's been a long time since Norton Utilities really improved its software for the Mac. Too long. Now Central Point Software introduces a newer, faster, smarter Mac utility–new MacTools 3.0. How much smarter is it? It retrieves accidentally trashed files in one step. (With Norton, it takes seventeen.) It continuously checks for disk corruption in the background, so small problems don't become disasters. (Norton doesn't.) MacTools 3.0 also finds and fixes Desktop file damage. (Norton can't.) And unlike Norton, it includes complete anti-virus protection, with network support. But that's just scratching the surface. For a detailed comparison of MacTools 3.0 vs. Norton, call FAXBACK at 1-800-847-8766 and ask for document 97532. For all upgrades, just call 1-800-277-3873. And stop living in the past.

UPGRADE FROM MACTOOLS, NORTON, SAM OR VIREX ONLY $49.95* 1-800-277-3873

*Upgrade from MacTools, Norton Utilities, SAM or Virex. Offer good only in U.S. and Canada. Shipping and handling extra.

CENTRAL POINT

Circle 93 on reader service card

WillMaker 5.0

Legal Software

PROS: Quickly and easily automates the creation of wills, health-care directives and proxies, and final-arrangements documents; offers excellent supporting explanations, examples, and background. **CONS:** No way to search for topics or navigate within online help.
COMPANY: Nolo Press (510/549-1976).
LIST PRICE: $69.95.

MW ★★★★

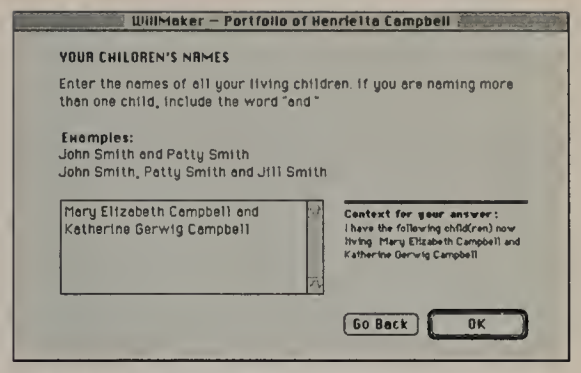
RIGHT AT THE TOP OF MOST PEOple's avoid-at-all-costs lists are dealing with lawyers and planning for their own demise. Nolo Press's WillMaker 5.0 takes much of the pain out of the latter—partly by eliminating the need for the former.

Like other Nolo Press software, WillMaker accomplishes its task by interviewing you about your needs and wishes. Brief supporting explanations and occasional recommendations accompany the questions. You can get more-detailed assistance from newly enhanced help screens specific to the questions at hand, and from the excellent manual (cross-referenced on the help screens), which describes not only the program but also the background and legal ramifications of your decisions, all in straightforward English. You can mark help screens for easy recall later on, but you can't navigate from screen to screen in the online help or search for help on a specific topic.

Version 5.0 of WillMaker allows you to make up to 100 bequests in your will. And you can now designate a property guardian for your children, regardless of whether their property is a product of your will.

The latest version of WillMaker also helps you prepare legal documents regarding health care and final arrangements. Health-care documents include a health-care directive (more commonly called a living will), which specifies the medical treatments you want either provided or withheld should you be unable to communicate your wishes; and a health-care proxy or durable power of attorney, which gives another person the authority to see that the instructions in your health-care directive are carried out, should that become necessary. WillMaker's final-arrangements document indicates what you want in the way of burial, cremation, memorial service, and the like.

When you've answered all of WillMaker's questions, you can review and revise the resulting document, print it, or export it for printing in another program. WillMaker's own Print options are limited—you can set margins, typeface, font size, and line spacing—but are adequate to the task. Final documents include instructions on signing, witnessing, and (if needed) notarizing. There's even a set of legal-style storage envelopes for each type of document.



Where There's a Will Before WillMaker draws up your will, you respond to questions by selecting options and entering requested text.

WillMaker tailors your documents to the laws of the state in which you reside, and the documents it creates are valid in all states except Louisiana. Although its range of testamentary possibilities is not adequate for very large or unusually complex estates, WillMaker's will-writing abilities should be more than sufficient for most people. Its other features are appropriate for everyone, however, and the program now lets immediate family members use its services as well.

Overall, I can't imagine an easier and more economical way of planning for the inevitable.—ROBERT C. ECKHARDT

Snap Mail 1.01

Electronic-Mail Software

PROS: Inexpensive; easy to install; definable message forms; Talk mode. **CONS:** Fixed-size window; displays only one item at a time; no font selection. **COMPANY:** Casady & Greene (408/484-9228). **LIST PRICE:** 5-pack $200; 10-pack $320; 50-pack $1440.

MW ★★★

OFFICE ELECTRONIC-MAIL SYSTEMS can be a bear to set up, with servers, system administrators, and gateways to worry about. Snap Mail, designed for easy setup and administration on AppleTalk networks, lets you forget those worries.

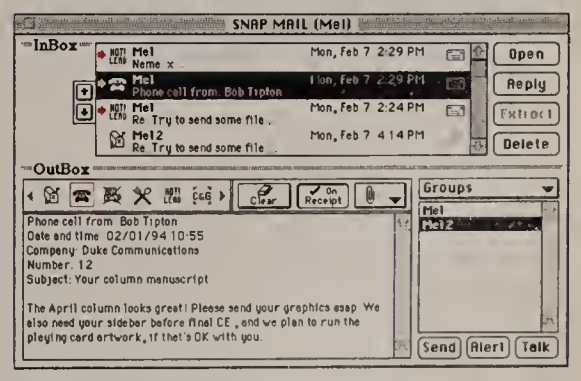
You buy Snap Mail by the user—5, 10, or 50 at a time. The package includes a single installation disk, a manual, and a quick-reference card for each user. You can install Snap Mail on each Mac or remotely over an AppleTalk network. Once installed, Snap Mail limits the number of simultaneously connected Macs to the number of licensed users; you can increase the number with a phone call to Casady & Greene.

Using Snap Mail is, well, a snap. You open the application either from the Apple menu or with a configurable hot key, and a window appears with InBox, OutBox, and user-list panes. To send a message, you simply type it into the OutBox. (You can optionally attach files by clicking on the paper-clip button.) Then you select one or more destinations from the user/group list, press Send, and the receiving Mac instantly chimes as the delivered message appears in its InBox. A pull-down menu allows you to configure Snap Mail's numerous options for user groups, alerts, receipts, forwarding, and other preferences.

As well as being easy to set up and easy to use, Snap Mail includes two clever features: message forms and Talk mode. With message forms, you create fill-in-the-blank templates for composing standard messages such as phone notes or sales leads. Talk mode lets you carry on typed conversations in real time with any number of other Snap Mail users.

By default, Snap Mail operates in serverless mode; that is, if a destination Mac isn't online when you send a message, the sending Mac retransmits the message automatically when the destination Mac comes online. This only works, though, if the sending and receiving Macs are both online together at *some* time. If they aren't, you can designate a single Mac as a server to hold and forward messages for absent users.

Because Snap Mail is a low-end package, it can be forgiven the lack of such sophisticated features as gateway routing, styled text, and embedded graphics. However, Snap Mail has a few surprising and irritating shortcomings. You can't resize its main window, you can't change the size or font in which text is displayed or printed, and you can view only one message at a time. Multiple, resizable windows and selectable fonts are fundamental features common to virtually all Mac applications; their absence in such a general-purpose tool is definitely frustrating.



Fill-in-the-Blank Snap Mail's definable message forms let you create standard E-mail templates, such as the one shown in the OutBox.

Nevertheless, if you can live with these annoyances, Snap Mail will put you on the electronic-mail trail more easily and more cheaply than any competing product. —MEL BECKMAN

DrawingSlate

Digitizing Tablet

PROS: Small, inexpensive ADB device.
CONS: No custom settings files; heavy stylus.
COMPANY: CalComp Digitizer Division (714/821-2000). **LIST PRICE:** 9-by-6-inch tablet $395.

MW ★★★

THE DRAWINGSLATE IS AN ADB TABlet with a 9-by-6-inch active area. The tablet also comes in 12-by-12-inch and 18-by-12-inch configurations. Along the tablet's top are 4 mode buttons and 18 function keys, which are programmable by means of a control panel. The tablet is covered with a transparent overlay that accommodates a drawing underneath for tracing.

The 9-by-6-inch tablet includes a three-switch, battery-powered, pressure-sensitive stylus that's about the size of a large pen. To save power, the DrawingSlate's battery-powered stylus has a sleep mode. Some operations that require precise placement, such as aligning type in a layout, are a little tricky using any stylus. The batteries in this stylus make it slightly top-heavy and therefore difficult to hold perfectly still when you release an object. I added a heavy pen grip to the tip to help balance it, but the mouse may be easier to use for some operations.

A control panel allows you to set all parameters affecting the performance of the tablet and stylus, including orientation, macro-key assignment, stylus-switch function, screen-to-tablet mapping, and mouse or tablet mode. The control panel also includes thorough online help.

Although the control panel does not let you save multiple preference settings, you can set two separate tablet-to-screen mappings that are accessible through the mode buttons on the tablet. (As with all tablets, cursor speed is determined by the ratio of the active tablet area to the screen area.) The tablet also works with multiple monitors. You can allow the cursor to move across all screens or restrict cursor movement to one screen. The control panel also has a Wacom-compatible pressure-sensitivity scale, although Fractal Design Painter is the only commonly used application that requires this scale.

The stylus tip and barrel buttons, along with each of the 18 function buttons, can be programmed to play any key or key combination. This lets you play a program's function keys or preexisting macros using the stylus and the function buttons on the tablet.



KEVIN CANDLAND

DrawingSlate

The DrawingSlate manual is very brief, covering only the basics of operation and maintenance. Thankfully, a 24-hour BBS is available for more-esoteric issues as well as technical support and software upgrades. The tech-support staff is easy to reach via an 800 number during business hours.

Most heavyweight graphics programs take advantage of pressure sensitivity. In paint programs, pressure can vary attributes such as paint opacity, color, and rate of flow as you draw, letting you create effects that are simply not possible with any other input device. A stylus takes some getting used to, but the advantages of pressure sensitivity far outweigh that drawback. And while it's not a deluxe package, the DrawingSlate is a good, compact, low-cost implementation of pressure sensitivity.—MATT NIELSEN

Notebook Printer II

Portable Printer

PROS: Lightweight; built-in five-sheet paper feeder; prints crisp, black type; prints in color.
CONS: Hard to align envelopes for printing; color printing is slow. **COMPANY:** Citizen America (310/453-0614). **LIST PRICE:** $399.

MW ★★

THE BEST THINGS ABOUT CITIZEN'S Notebook Printer II are that it weighs only 2.6 pounds (with its NiCad battery installed) and prints crisp, clear, black type even on poor-quality paper. Its small size, 4.1 by 11.7 inches, takes up just an inch more room on my desk than a box of 40 business-size envelopes.

The Notebook Printer II is a thermal-fusion printer that uses heat to bond ink onto the paper from a cartridge ribbon similar to that of a typewriter. Because the printer doesn't spray liquid ink onto the paper—as do its major competitors, Apple's Portable StyleWriter and Hewlett-Packard's DeskWriter 310—the type of paper you use doesn't greatly affect print quality. Even on thin, nonabsorbent paper (the kind provided at the hotels where I stay), the Notebook II produces crisp, black type that stays on the page even after repeated folding or rubbing.

The Notebook II also prints in color, with a special four-color ribbon and the included Citizen Notebook Printer II driver installed. I wouldn't use this as a color printer very often, though, because the process is wasteful (the ribbon advances through each of the four colors until it finds an area that it needs, wasting the rest); because it is slow (a 1-page Microsoft Word document with colored headings took more than 15 minutes to print); and because Hewlett-Packard's ink-jet DeskWriter printers do a much better job of printing good-looking color at a budget price. (The Notebook II's optional color ribbons are sold only in packages of five, and according to the company, the suggested price is $6.99 per ribbon.)

With the Notebook II's built-in 5-page sheet feeder, you can easily align sheets of paper, a task that can be a difficult on tiny printers. The Notebook II also has an ingenious design that stacks finished sheets on top of the printer so that they don't get in the way of the sheets being printed. To print envelopes, you stand the printer on its back and feed the envelopes manually through a slot in the back. This works well enough, but because they go in flap-first, aligning the envelopes can be difficult (you're feeding in an angled edge). An optional 30-page sheet feeder is available ($69), but the Notebook II is too slow to be effective when printing documents much longer than 5 pages.

If speed is worth a few extra pounds to you, buy HP's DeskWriter 310. With the battery installed, it weighs 1.7 pounds more than the Notebook II, but it prints text nearly three times as quickly.

Moreover, if gray-scale or color printing on the road is what you care about, the Hewlett-Packard DeskWriter 310 does a better job on both types of graphics documents. Although you can recognize a photograph printed using the Notebook Printer II, the image is disappointing: all the dark tones blur together, and the light shades don't stand out.

But if weight and size are your biggest concerns in choosing a portable printer, and if you print primarily in black-and-white, choose the Notebook II. Its text-print quality is sharper than that of its ink-jet brethren, and it's better at handling a wide variety of paper types. If there's any chance you'll need a printer where you're headed, pack this one. You won't regret it. I've packed shoes that were heavier and bulkier than the Notebook II. —LIZA WEIMAN

WE'RE REDEFINING
WHAT YOU SHOULD EXPECT
FROM A PRINTER.

FlipBook 1.0

Animation Printing Tool

PROS: Easy to use, fun; excellent output. **CONS:** On the expensive side. **COMPANY:** S. H. Pierce (617/338-2222). **LIST PRICE:** $89.

MW ★★★★

ONCE UPON A TIME, IN THE DAYS before computers talked and digitized video, people made movies using a pen and paper. These movies, called flip-books, consisted of a series of images drawn on paper that, upon application of an extremely technical thumb-and-forefinger method, appeared to move.

The ice-age period of filmmaking is long gone, but never fear—S. H. Pierce has come up with a software product that lets you return to the past. FlipBook lets users make their own flip-books out of Scrapbook files, QuickTime movies, and PICS animations.

To create the flip-book pictured here, I used my highly developed artistic skills to draw several images in Adobe Photoshop. I then copied the images to my Scrapbook and opened the Scrapbook from FlipBook. (In order to import correctly, the images in the Scrapbook must all be the same size.) Once I opened the Scrapbook in FlipBook, my eight images appeared as a movie that I could play.

You can also import a QuickTime movie. For both movies and line art, the type of image you use will affect your output. Images with minimal color contrast will not print as nicely as those with highly contrasting colors.

The FlipBook application enables you to open and play files and prepare them for printing. The software has no image-editing or animation functions, so to make the most of this product, you will need your own image-editing program. FlipBook's limited functions make its price of $89 seem a bit high—even its approximate street price of $60 is a little more than I would pay for this product.

FlipBook comes complete with 50 sheets of perforated paper for printing your flip-books, and S. H. Pierce also sells the paper separately (50 sheets with 10 cards a sheet for $16.95). The Flip Setup option allows you to select the paper type, add guidelines, and choose the side on which to bind the book.

FlipBook requires 2MB of RAM and about 900K of disk space. S. H. Pierce says FlipBook is compatible with both QuickDraw and PostScript AppleTalk printers. I printed samples on an Apple LaserWriter IINTX, and print quality was excellent. The product also comes with Lafe Locke's *Film Animation Techniques* (Betterway Books, 1992), a book for beginning animators that gives guidance on what types of images will create the best flip-book.

FlipBook doesn't do much besides help you make flip-books. It is good at its job, though, and if you want to make flip-books out of your digital images, you may want to shell out $60 or $70 for this product. Of course, you could also just print your images and arrange them into a flip-book yourself. For the bored executive or for parents who want to educate their children about the olden days, FlipBook is a good high-tech option for a low-tech task.

—JOANNA PEARLSTEIN



My Flip-book Do you really need a computer to do this? I drew this stunning series of images in Adobe Photoshop and copied them to my Scrapbook, and FlipBook made them into a movie.

UnderWare 1.0.1

Screen Saver/Desktop Enhancer

PROS: Amusingly animates your desktop; can use most After Dark modules. **CONS:** Desktop animation can slow foreground processes; uses 5.8MB of disk space. **COMPANY:** Bit Jugglers (415/968-3908). **LIST PRICE:** $59.95.

MW ★★★

TERMS LIKE *WACKY* AND *SILLY* ARE usually not what software authors hope to hear about their first product. But when applied to Bit Jugglers' UnderWare, they're a compliment. UnderWare is a control panel that adds three features to your Mac's desktop. It's a screen saver. It allows you to personalize your dull desktop with one of dozens of patterns. But UnderWare's unique claim to fame is its ability to run animations on your desktop, *underneath* your windows and icons.

If these animations don't make you grin, you may need a humor transplant. Cartoon babies crawl across your screen in the Babies module, pausing briefly while thought balloons with text that you've defined pop up above their heads. With the Dragon module, a fire-breathing saurian burns holes in your desktop. Ballerinas pirouette; a *T. rex* stomps; and the Jungleman swings on vines across your screen. You can even have Rubber Chickens flying in formation.

Better yet, many animations interact with your desktop's icons and windows. The Robber skulks on screen, rummages through the icons, then gets chased off screen by the cops. Jungleman is likely to slam into the side of an open window. And many of the modules act differently when used as screen savers. For example, Blastoff launches rockets from the bottom of your screen when used as a Desktop Animation; when it's a screen saver, your desktop's icons rise on a jet of animated flame.

The price you pay for this whimsy is mostly measured in disk space; full installation takes 5.8MB, and gives you 100 desktop patterns and 26 animated modules. If you have a 640-by-480-pixel screen running in 8-bit mode, UnderWare takes a moderate 80K of RAM. Also, the program is good about not slowing your Macintosh; the Desktop Animations halt when UnderWare senses your Mac is busy, such as with mouse, keyboard, or network activity, or when the serial port is receiving data from a modem.

UnderWare can also run Berkeley Systems' After Dark modules, except for the Star Trek and Disney module sets.



Dragon Halitosis A not-very-fearsome fire-breathing dragon wanders across my desktop, burning a hole in the Tree Bark pattern I've selected.

UnderWare has a few incompatibilities with older versions of some utilities. It doesn't work with Connectix's PowerBook Utilities 2.0 or Symantec's CopyDoubler 2.0.1; updating to the latest versions of these programs, 2.0.1 and 2.0.3, respectively, fixes the problem. As I was writing this review, Bit Jugglers released a free updater program (version 1.0.1) that fixes minor incompatibilities. The updater is available on America Online, CompuServe, and AppleLink.

There's no businesslike reason to have UnderWare running on your Mac. But don't underestimate the value of a smile while you work. UnderWare is inspired, silly fun for your Mac's desktop.

—TOM NEGRINO

Flexibility (ˌflek·sə·ˈbil·ət·ē) *n.* 1. A feature previously not found in this category. *example:* For under $800, **TI microWriter™** printers with **Adobe® PostScript®** give you more networking and paper handling *flexibility* than Apple and HP, at a lot lower price.



THE UNDER $800 PRINTER, REDEFINED.

If you're looking for a PostScript printer with a street price well under $800*, you'll have a hard time finding one with as many features as a TI microWriter.

Just look at the chart and compare it to our leading competitors, Apple and HP. Then, when you're ready for a full-featured printer that's truly flexible, at a price that's truly affordable, take a look at a TI microWriter. For more information or a dealer near you, call *1-800-TI-TEXAS* (1-800-848-3927).

		TI microWriter PS23	Apple LaserWriter Select 320	HP 4ML
Print Speed		*5 ppm*	*4ppm*	*4 ppm*
Mac/DOS Compatibility		*Standard*	*Mac Only*	*Standard*
Paper Trays	*(std.)*	*250 sheet*	*100 sheet*	*100 sheet*
	(opt.)	*250 sheet*	*Not Avail.*	*Not Avail.*
Auto Emulation Switching		*Standard*	*Not Avail.*	*Standard*
List Price		*$799*	*$959*	*$1279*

EXTENDING YOUR REACH WITH INNOVATION™

TEXAS INSTRUMENTS

3/21/94

Specifications in chart are based on information as of 3/94. *Estimated dealer price. Dealer prices will vary. microWriter and "Extending Your Reach With Innovation" are trademarks of Texas Instruments. Adobe, PostScript and the PostScript logo are registered trademarks of Adobe Systems, Inc. © 1994 TI

Circle 265 on reader service card

SimCity 2000

Simulation Game

PROS: Lovely graphics; easy-to-use palette; complex yet straightforward; entertaining and engrossing. **CONS:** Minor bugs and annoyances. **COMPANY:** Maxis Software (510/254-9700). **LIST PRICE:** $69.95.

MW ★★★★

SOME MAXIS SIMULATIONS ARE SO complicated that the learning curve is more like that of a 3-D rendering program than a game. But SimCity 2000 is both dazzlingly simple and fascinatingly complex.

In essence, the goal is to build a city and run it successfully. You need to develop a solid infrastructure, including a water system (new in this version), power supply, roads, and public transportation. You face urban problems, such as high crime and traffic. You also face natural disasters—and some that are unnatural, such as monsters and chemical spills.

An easy-to-use palette gives you all the tools you need. Its top 15 buttons provide the ingredients: zoning, landscaping, and city services. The zone tools now include libraries, museums, prisons, marinas, and zoos. You can tear other buttons off the palette, creating windows that provide detailed information about your city. The windows show charts, graphs, maps, and visual displays of everything from pollution levels to your city's budget and tax rates.

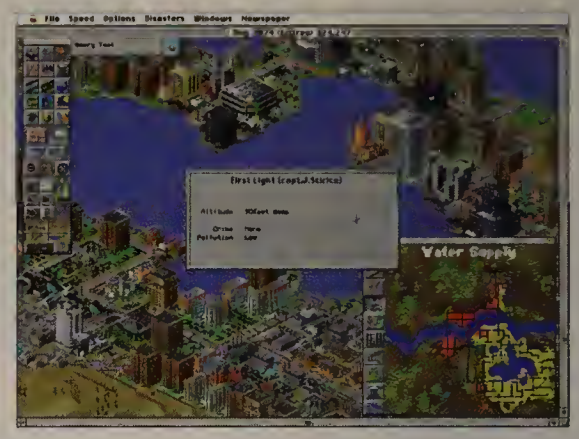
But playing the game is only half the pleasure; SimCity 2000 is also fun to watch. As you provide zones, the Sims (the people who live in your city) build. And their buildings are incredibly detailed. From quaint bed-and-breakfast inns to convenience stores, condos with swimming pools, and industrial thingamajigs, these are buildings that real people could live in.

The detailed help system is easy to access. Hold down the shift key and click on any button; the help window explains what that button does. There is also a query tool for information about any building.

To completely describe the game would take about 140 pages—the length of the well-written and entertaining manual. Briefly, other features include arcologies—huge, enclosed cities within your city; new types of power, including wind power; newspapers giving the Sims' opinions; and a terrain generator that lets you develop a landscape to your own specifications.

Alas, SimCity's not perfect. Various minor bugs and misguided features are annoying. It's hard to plan a subway around your water system, and there's no way to view only one or the other. There's also no easy way to see the entire subway, as, unlike the roads and trains, it's not included in the map window. Ordinances get passed without your approval, and you may have to shell out thousands for energy conservation when a new power plant would be much cheaper. Furthermore, when your city gets big, some building descriptions no longer contain useful information. And finally, the newspapers all assume that the mayor is male—a minor, but depressing, sexism.

Overall, though, SimCity 2000 is marvelous. Maxis has done a superb job of improving on an already good thing.
—WENDY SHARP



First Light J. Scirica is the lucky Sim captain of all the Sim boats in all the Sim cities. Meanwhile, the map in the bottom corner shows that my city's water system needs help.

Crystal Crazy

Arcade Game

PROS: Fun; challenging; great sounds and graphics. **CONS:** Zinkleflashoxicationizers are really nasty. **COMPANY:** Casady & Greene (408/484-9228). **LIST PRICE:** $49.95.

MW ★★★★

CRYSTAL CRAZY IS AN ULTRAGLOSSY, superpolished version of Casady & Greene's Mac game Crystal Quest. Crystal Crazy is an arcade game played in successive levels, or waves. You are in command of a small chickpea-size spaceship that is trapped in a wave until you've completed that wave's objective. Objectives range from picking up crystals to wiping pictures clean to smashing fragile objects (my personal favorite). This probably sounds easy, but wait until you're confronted by the Nasties. Nasties are various forms (20 in all—one called Zinkleflashoxicationizers) of space aliens whose antics change from dopey to devious as the waves progress.

A wave starts with your ship in the middle of the game area. Portals on both sides spit out Nasties at random intervals. The exit gateway at the bottom of the screen remains closed until you complete your objective.

You score points in several ways. During wave play, you collect points by sliding over point boxes, sailing after bonus crystals that appear randomly, and killing Nasties. Escaping a wave before the preset time yields bonus points.

The best way to rack up points is the bonus wave, which occurs after every third wave. In this free-for-all bonus wave, you collect point boxes, a few smart bombs, and sometimes ships—without worrying about the various Nasties. But you must select these points before two slowly moving doors smash your spacecraft.

Randomly appearing throughout the levels are five shields and five special guns that you can pick up to help defend yourself. The shields range from the rubber hat (protects against mines, portals, and gateways but doesn't keep you from crashing into Nasties or being hit by bullets) to the MaceHead (obliterates Nasties but doesn't protect you from bullets). The special guns include a multigun (sprays four simultaneous streams of bullets) and the Captivator (captures Nasties and tows them along).

But wait, there's more to Crystal Crazy than just great game-playing excitement. You can adjust the sound level from within the game, and pause play by hitting the tab key. All new games start with wave one, unless you save a game in progress. And large-monitor owners can expand the playing area to the full screen size.

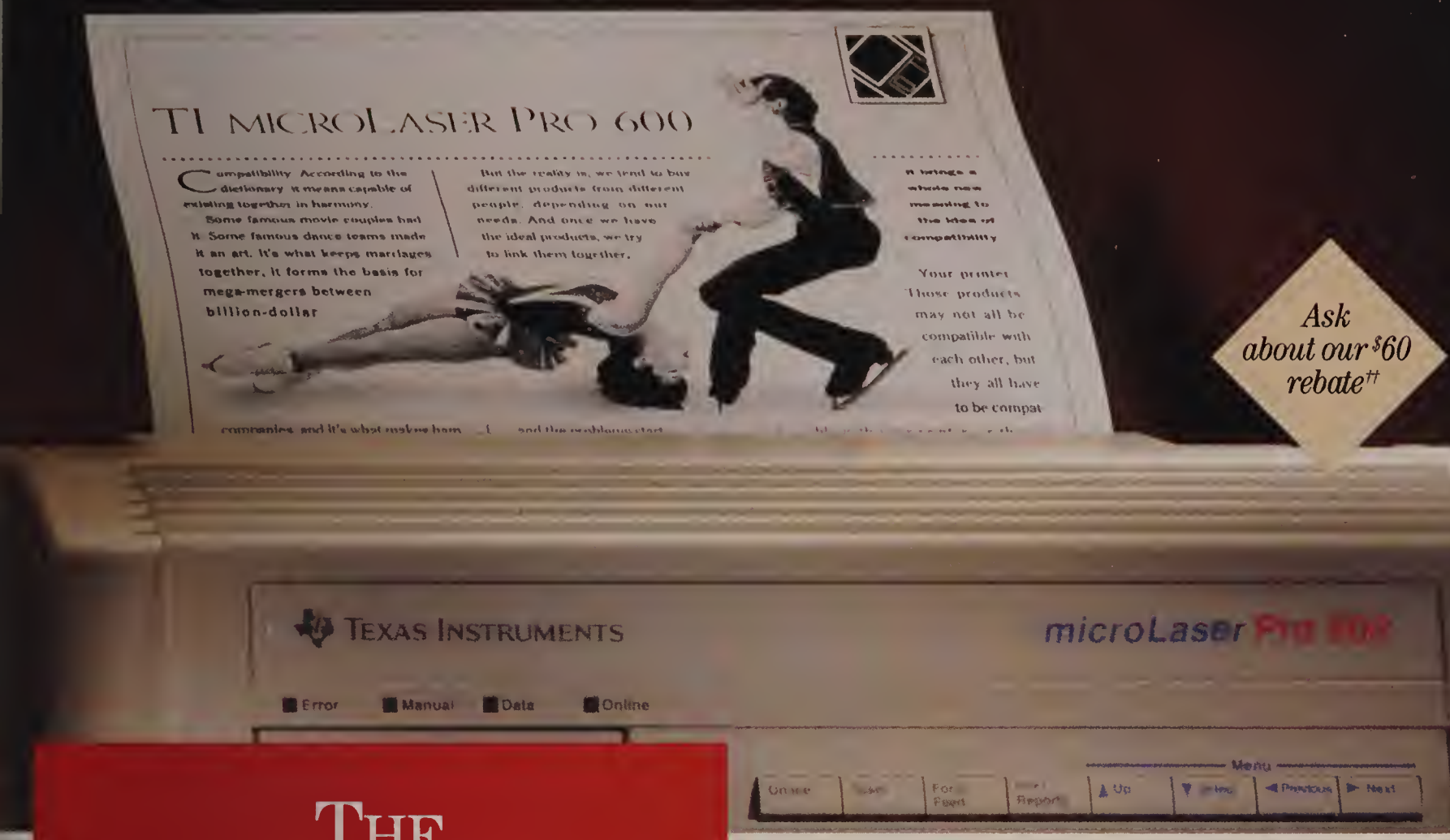
The status bar at the top of the screen displays information about your current ammunition supply, points, and weapons status, among other things.



Nasties Battle Your ship (lower right, with spiked armor) is surrounded by dispensers, mines, and Dronefuls. As quick as your jets can jive, you can collect the smart bombs, bonus points, and crystals. Then unpaint the pictures before escaping through the portals.

Crystal Crazy is everything a computer game should be. It's challenging and fun without being impossible. Each level has some old elements, with a few new ones to keep you on your toes. It took five games to get a million points, pretty good for a Pong throwback like me.—MATT CLARK

Compatibility (kəm·ˌpat·ə·ˈbil·ət·ē) *n.* 1. A feature rarely found in this category. *example:* The **TI microLaser™ Pro 600** gives you Mac,® DOS, Windows,™ PostScript® and PCL®5 *compatibility* standard. HP charges hundreds more.



THE UNDER $1400 PRINTER, REDEFINED.

When we set out to design the ideal 600 dpi printer, we asked thousands of users what they wanted most. And the result is the TI microLaser Pro 600. As you see from the chart, not only do we give you more, we charge you less. And if blazing speed for heavy graphics printing is required, check out our 40MHz PowerStep™ upgrade. It's a great way to protect your investment as your processing needs become more complex. For more information or a dealer near you, call *1-800-TI-TEXAS* (1-800-848-3927).

	TI microLaser Pro 600	HP LaserJet®4M
True 600 dpi	*Yes*	*Yes*
Speed/Processor	*8ppm/RISC*	*8ppm/RISC*
Emulations	*PCL5/Adobe® PostScript 2*	*PCL5E/Adobe PostScript 2*
40MHz Processor Upgrade	*Optional*	*Not Available*
Compatibility	*Mac/DOS*	*Mac/DOS*
Toner Cart. Life	*15K pages†*	*6K pages*
Paper Trays	*250/250 sheet*	*250/100 sheet*
List Price	*$1599**	*$2479*

EXTENDING YOUR REACH WITH INNOVATION™

TEXAS INSTRUMENTS

Specifications in chart are based on information as of 3/94. *Estimated dealer price including manufacturer's rebate is under $1,400. Dealer prices may vary. †At 4% coverage. ††Rebate applies to PS 23 and PS 65 models purchased April 1, 1994 through June 30, 1994. microLaser, PowerStep and "Extending Your Reach With Innovation" are trademarks of Texas Instruments. Adobe, PostScript and the PostScript logo are registered trademarks of Adobe Systems, Inc. Windows is a trademark of Microsoft Corporation. Mac is a registered trademark of Apple Computer, Inc. LaserJet and PCL are registered trademarks of Hewlett-Packard, Inc. © 1994 TI.

Circle 266 on reader service card

Firefall Arcade

Arcade-Style Game

PROS: Brilliant graphics; easy to pick up. **CONS:** Mindless fun (if that really is a con); nothing new. **COMPANY:** Inline Software (203/435-4995). **LIST PRICE:** $49.95.

MW ★★★

HARK BACK TO THE HEYDAY OF video arcades . . . remember Centipede? In Firefall Arcade, the centipede is called a fireworm, but the game is still a fun way to waste time.The fireworm races down the screen, bumping into barriers, changing directions, splitting into pieces, and plummeting toward your ship at high speed. Shoot it! See it pop and segment! Destroy six worms and you're on to the bonus round.

The screen is bordered by brick walls. A status box containing score, level, and number of lives is on the right. Destructible barriers, among which the fireworms career and you maneuver, litter the screen. There are also everlasting barriers, which creep from the sidelines and float into position among the normal barriers. While they're mobile they're vulnerable; once they're fixed they're (almost) indestructible.

The fireworm isn't your only target or danger: barrier droppers excrete destructible barriers and kill on contact; slideworms—lethal spinning pasta—also destroy on contact; and prisoner cubes dog you, always trying to herd you toward disaster. If one touches you, you explode.

On your side are temporary power boosters called powerups. Powerups give you shields, double- and treble-shot guns, and free lives; they also freeze targets and dephase your ship (allowing you to travel through barriers). There are also several helpers—some might call them cheats—hidden in the game (just think ⌘ keys and developers' names).

To play Firefall Arcade, you need 256 colors and at least a 13-inch monitor, plus about 3.4MB of RAM. The game runs on anything from an LC up. On an 040 machine you can play in enhanced mode, with even more graphics and longer fireworms.

You won't need to read a manual or spend hours learning this game. There is, in fact, no manual, only a threefold card, which lists all the information you need to play: key commands, point values, the different powerups, tech-support numbers, strategy, and installation instructions.

The action on Firefall Arcade seems to change with the input device. I played it with the Apple Desktop Bus Mouse II, the Kensington Turbo Mouse trackball, and the



Bonus Round A flying worm swoops into range three times. You get a 10,000-point bonus for each worm destroyed.

Advanced Gravis GamePad, and found none completely satisfactory at first. I experienced restricted or slow movement or an irritating float factor that sent me coasting into death traps. However, a call to Inline's tech support set me straight on optimum settings (use the penultimate fast setting for the Apple mouse and the Deliverance gameset for the GamePad).

I wish Firefall Arcade had a save-as-you-go option, but in that respect it's very arcadelike: when you're outta lives, that's it. While the designers have really added nothing new to an old video game, if you loved Centipede or are just looking for a fun shoot-'em-up, Firefall Arcade will satisfy.

—SUZANNE COURTEAU

Spin Doctor

Arcade Game

PROS: Flexible environments encourage experimentation; play is challenging and engaging. **CONS:** Time limits need adjustment. **COMPANY:** Callisto Corporation (508/655-0707). **LIST PRICE:** $59.95.

MW ★★★★

SPIN DOCTOR ISN'T MERELY AN arcade game; it is part strategy game and part kinetic sculpture as well. In it, you are a wand rotating endlessly around a dot in a land of dots. You can hop from one dot to another, bounce off dots, and switch directions, but you can never stop. Meanwhile, you have to negotiate a variety of obstacles to arrive at the goal—a particularly shiny dot that takes you to the next level. The obstacles include walls, killer spikes, enemy wands, and puddles of acid that chase you around the screen.

The strategy comes in deciding when to move and when to use available resources, including door switches, fuses attached to bombs, and so-called hyperdots that transport you to different parts of the screen. For example, you can use a bomb to blow up a door switch; this holds the corresponding door open so you can pass through it at your leisure. But you might also have to blow up a bonus dot that would have boosted your score. Much to its credit, Spin Doctor doesn't require you to carry out any specific action. You can pass through a level simply by moving adroitly and cautiously, or you can take advantage of every resource around you. No single decision means certain success or failure.

To keep things interesting, Spin Doctor includes 106 playing environments and 4 levels of difficulty. The first 10 or so environments walk you through the elements you'll encounter, in effect, teaching you how to play the game. In fact, most folks will be able to set about playing without reading the slim manual. With the possible exception of the strange keyboard controls, Spin Doctor is totally straightforward.



That Burning Sensation When you pass your spinning wand over a green acid puddle, the puddle wakes up and chases you. If you're quick enough to escape the acid, it drips harmlessly off the screen.

The first level of difficulty lets you play very slowly with no time limit. At this level, the game feels more like solitaire than an arcade game. Each higher level increases the speed at which the wands rotate and limits the time you can spend in an environment. The time limits are usually appropriate, but every once in a while they seem either too long or too short. On rare occasions, I could meet the time limit only by recklessly ignoring every obstacle and hoping for the best as I hurled my wand toward the goal. At other times, I could easily reach the goal with more than half the time remaining.

If you're looking for a challenge, however, Spin Doctor delivers. Some environments look absolutely impossible at first glance and require a few minutes of study before you can even approach them. Better still, the game takes frequent twists, forcing you to question the lessons you learn along the way; just as you master weaving between enemy wands, for example, the enemies slow down, completely upsetting the rhythm you've developed. In the tradition of the best Macintosh games, Spin Doctor tests your wits and your reflexes alike.

—DEKE McCLELLAND

Satisfaction (ˌsat·əs·ˈfak·shən) *n.* 1. A feature previously left to chance in the purchase of a printer. *example:* When you buy a new TI printer*, your ***satisfaction*** is ***guaranteed*** or call TI within 30 days and we'll take it back.



THE WAY YOU BUY A PRINTER, REDEFINED.

In the past year, we've introduced a whole new line of printers. And as you've seen in the previous pages, they're some of the most advanced printers on the market today. But now, we're also going to change the way you buy a printer.

When you buy one of these new TI printers, if you need any help at all, simply call us toll-free at 1-800-TI-TEXAS, and we'll work with you. Then, 30 days from date of purchase, if you're still not completely happy, call TI and we'll take it back.

It's as easy as that. That's how confident we are in each printer we make. And even after the 30 days, you can continue to call the 800 number for any help you may need.

For additional information about the TI microWriter™ or the TI microLaser™ Pro 600 printers, and for the name of a dealer near you, call *1-800-TI-TEXAS* (1-800-848-3927). And see for yourself how TI is redefining what you should expect from a printer.

EXTENDING YOUR REACH WITH INNOVATION™

TEXAS INSTRUMENTS

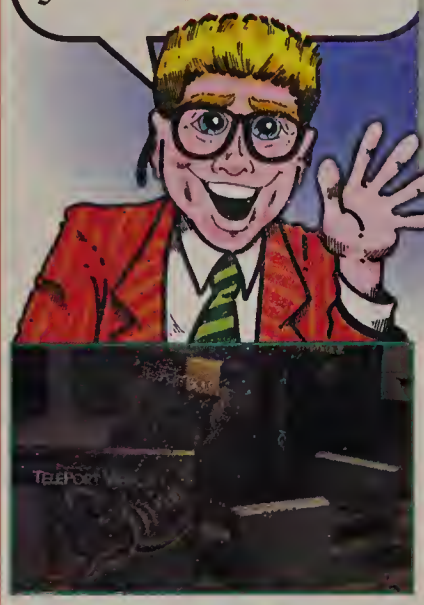
*Offer applies to all new microWriter and microLaser Pro 600 printers, if returned in good condition. microWriter, microLaser and "Extending Your Reach With Innovation" are trademarks of Texas Instruments. ©1994 TI.

Circle 267 on reader service card

COMPUTER DISCOUNT WAREHOUSE™

CDW® YOUR COMPLETE SOURCE FOR HARDWARE & PERIPHERALS

Mac Deal$™ says: "Let me introduce you to CDW"



CDW®

- The premier direct marketer of PC products
- 10 years in business
- Most orders ship the same day
- Toll-free technical support for CDW customers

Total commitment to customer satisfaction

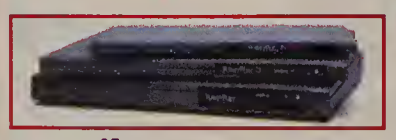
Global Village Communication TelePort Modems

✔ Includes award-winning GlobalFax™ software

TelePort Mercury (19.2K bps data) ..... **$314.37** CDW 36713

TelePort Gold (14.4K bps) ..... **$273.60** CDW 36712

TelePort Silver (9600 bps) ..... **$249.45** CDW 36714



Technöggin PowerPlate Rechargeable Power Systems

✔ Up to 5 times the battery life for your PowerBook

PowerPlate 5X **$254.91** CDW 39432

PowerPlate 3X **$204.51** CDW 39431

PowerPlate mini ..... **$144.56** CDW 39427



Magnavox CM2080 14" .29mm Monitor

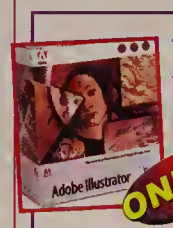
ONLY! **$249.80** CDW

Adobe

Acrobat Exchange 1 user	125.89
Dimensions	119.55
Illustrator V5.0	359.06
Illustrator V5.0 DLX CD	439.38
Photoshop V2.51	539.06
Photoshop V2.51 DLX CD	615.94
Premiere V3.0	444.38
Premiere V3.0 DLX CD	508.31
Streamline V3.0	127.87
Super ATM	93.06
Type Basics	118.98
Type Manager V3.6	39.86
TypeSet Value Pk	38.76

Aldus

Datebook Pro V2.0	44.45
Fetch V1.2	185.73
Freehand V4.0	372.56
Gallery Effects Vol. 1	125.54
Home Publisher V1.0	44.53
IntelliDraw V2.0	125.54
Pagemaker V5.0	539.23
Persuasion V2.1	304.31
Pre-print V1.6	311.35
SuperCard V1.6	125.54
SuperPaint V3.5	44.92
Touchbase Pro V3.0	44.34



Adobe Illustrator V5.0

ONLY! **$359.06** CDW 31956

Altsys

EPS Exchange V2.0	85.93
Fontographer	248.84
Metamorphosis Pro V2.04	85.94

Ares

Font Chameleon V1.0	172.53
Font Hopper	39.24
Fontmonger V1.5	89.11
Aladdin SitCom	64.90
Aladdin StuffIt Space Saver	34.19
Avery MacLabel Pro	45.89

Broderbund

Automap Atlas	55.69
Bannermania	21.26
Carmen Sandiego/Time	29.45
Carmen Sandiego/USA DLX	39.24
Carmen Sandiego/World DLX	39.24
Carmen Sandiego/World DLX CD-ROM	53.85
Might and Magic III	34.84

Caere

OmniPage Direct	185.73
OmniPage Pro V3.0	299.65
OmniScan	375.87

Central Point

Anti Virus	41.58
MacTools V3.0	86.50
Safe and Sound	29.37

Claris

Brush Strokes	89.03
Brush Strokes Comp Upg	71.21
ClarisWorks V2.1	185.72
FileMaker Pro V2.1	247.71
FileMaker Pro V2.1 Comp Upg	109.98
Impact V1.0	247.71
MacDraw Pro V1.5	248.51
MacPaint V2.0	79.08
MacProject Pro V1.5	371.52
MacWrite Pro V1.0	155.05
MacWrite V1.1	82.49
Power to Go V2.0	45.55
Retreive It!	45.55

Connectix

Desktop Utilities	55.72
Maxima V2.0	43.33
On the Road V1.0	55.72
PowerBook Utilties	55.72
RAM Doubler	55.72
Colorage Freedom of Press Classic	79.59
CompuServe Membership Kit	24.64
Corel SCSI!	65.44

Dantz

Diskfit Direct V1.0	29.78
Diskfit Pro V1.1	69.60
Retrospect Remote V2.0	245.78
Retrospect V2.0	136.68

Datawatch

Citadel w/Shredder	55.69
ScreenLink V2.0 2 user	55.69
Superset Utilities	81.10
Virex V5.0	59.07

Delrina

DelrinaFax V1.5	79.62
Fer Side Daily Planner	38.59
Intermission Screen Svr	26.30
Opus & Bill Screen Svr	29.60

Deneba

Artworks V1.0	98.49
Canvas Tool Pecks	34.51
Canvas V3.5	255.61
Ultra Peint V1.03	53.80

Electronic Arts

Chuck Yeager's Air Combat	35.66
Cyberplasm Formula CD	32.94
Deluxe Music V3.0 CD	86.52
Harpoon II CD	41.60
PGA Tour Golf CD	35.66
Populous CD	29.40
Total Distortion CD	78.12
V for Victory II	41.60
Vampires Coffin CD	39.18
Victory at Sea	41.60

Entertainment

Berkeley After Dark V2.0	28.29
Berkeley Disney Screen Svr	27.81
Berkeley More After Dark	23.88
Berkeley Star Trek Screen Svr	28.45
Comptons Business Backround	25.30
Comptons Consumer Info	25.31
Comptons Deep Voyage	25.30
Comptons Full Bloom	25.30
Comptons Home Remedies	25.30
Comptons Jets & Props	37.11
Comptons King James Bible	16.57
Comptons Majestic Places	25.30
Comptons Movies	25.31
Comptons Tropical Rainforest	25.30
Comptons Wild Places	25.30
LucasArts Indiana Jones Last Crusade	21.00
LucasArts Loom	18.00
LucasArts Secret of Monkey Island	21.00
Maxis A-Train w/Contruct Set	39.95
Maxis DoodleMation V1.0	18.32
Maxis EL Fish	34.15
Maxis Robosport	23.28
Maxis SimAnt	29.12
Maxis SimCity 2000	39.82
Maxis SimCity Classic	23.28
Maxis SimEarth	29.12
Microprose Civilization	44.53
Microprose Railroad Tycoon	22.39
Microprose Rex Nebular	38.98
Paramount Jump Raven CD	38.98
Paramount Lunicus CD	38.98
Paramount Movie Select CD	34.19
Paramount Rock, Rap and Roll CD	38.98
Passport Music Time/Trax bundle	145.33
Passport Trax	59.68
Psygnosis Lemmings	34.21
Psygnosis Lemmings II	34.21
Psygnosis More Lemmings	28.47
Velocity Development Spectre	24.84
Velocity Development Spectre VR CD	38.98
Virgin 7th Guest CD	49.11

Fractal Design

Colorstudio V1.5	443.61
Painter V2.0	246.36
Painter/X2	67.30
Sketcher V1.0	48.90

Frame Technology

Framemaker V4.0	559.75
Framereader	74.51
Farallon Timbuktu V5.0	128.37
Freesoft White Knight 11	83.52
Gryphon Morph V2.0	139.60
Hayes Smartcom III V3.4	79.58
HSC Kai's Powertools V2.0	96.20



Berkeley After Dark

ONLY! **$28.29** CDW 30200

Inline

Cogito V1.0	34.19
Deliverance	28.47
Firefall	28.47
Icon 7	44.53
INITpicker V3.0	44.53
Spin Doctor	34.24
Super Maze Wars	28.34

Insignia

Access PC V3.0	79.92
RapidCD V1.0	41.57
RapidTrack V1.0	57.67
Soft PC V3.0	95.19
Soft PC with Windows	302.25
Solutions Pro V3.1	179.98

Interplay

Battlechess	17.91
Battlechess Enhanced	44.56
Checkmate	31.33
Dvorak on Typing	28.47
Out of this World	34.27
Peter Gabriel XPLORA 1	47.06
Star Trek 25th Anniversary	34.19
IMSI TurboCAD V1.0	75.69
Informix Wingz V1.1	241.66
Intuit Quicken V4.0	42.93

Kent Marsh

Cryptometic V1.0	55.15
Folderbolt V1.02	69.27
Folderbolt/Nightwetch bundle	119.91
Quick Lock V2.1	17.91

Lotus

1-2-3 V1.1	276.77
1-2-3 V1.1 Comp Upg	98.56
1-2-3 V1.1 Server	332.35
1-2-3 V1.1 Server Upg	98.56
Light Source OFOTO V2.03	253.05

Macromind

Macromedia Action Bundle	269.46
Macromedia Director V3.1	669.24
Macromedie Director V3.1 Upg	352.82
SoundEdit Pro	189.16
Swivel 3D Professionel	278.72



Microsoft FoxPro V2.5

ONLY! **$95.20** CDW 37657

Microsoft

Cinemania 1994	53.44
Excel V4.0	298.78
Excel V4.0 Upg	116.54
File V2.0	123.01
Flight Simulator V4.0	43.31
FoxPro V2.5	95.20
Office V3.0	453.36
Office V3.0 CD	469.83
PowerPoint V3.0	299.71
PowerPoint V3.0 Comp Upg	121.07
PowerPoint V3.0 Vers Upg	102.76
Project V3.0	418.86
Project V3.0 Comp Upg	139.24
Project V3.0 Vers Upg	121.49
Word V5.1	299.71
Word V5.1 Comp Upg	116.65
Word V5.1 Vers Upg	99.95
Works V3.0	151.85
No Hands Common Ground V1.0	89.43
Now Software Now Up-to-Date V2.1	59.49
Now Software Now Utilities V4.0.1	77.50
OuarkXpress V3.2	599.65

Ray Dream

AddDepth V1.0	115.01
Designer V3.0	223.59
JAG II	85.27

Sierra On-line

Freddy Pharkas	23.77
Hoyle Classic	28.47
Hoyle II	28.45
Japanese Alive CD	102.62
Kings Quest V	38.97
Kings Ouest VI	44.53
Leisure Suit Larry 1	17.91
Leisure Suit Larry 5	23.89
Nova 9	19.90
Police Quest 3	38.97
Police Quest 4	38.98
Space Quest IV	23.01
Stellar 7	11.91

Spectrum Holobyte

Falcon V2.2	35.28
Iron Helix CD	56.89
Super Tetris	29.78
Tetris	24.07
Wordtris	29.78

Symantec

ACTI V1.1	156.77
Autodoubler V2.0	58.38
Disklock V2.1	119.22
Greatworks V2.0	84.32
More V3.1	248.45
Norton PowerBook Essentials V1.1	83.72
Norton Utilities V2.0	93.62
PYRO! V4.1	27.33
SAM AntiVirus V3.5	64.22
Suitcase V2.1	49.74
Superdoubler V1.0	69.73
Software Ventures MicroPhone Pro	132.12
T/Maker Incredible Image Pak	79.74

WordPerfect

LetterPerfect V2.1	59.50
WordPerfect V3.0	288.29
WordPerfect V3.0 Comp Upg	79.71
WordPerfect V3.0 Vers Upg	49.73
Works V1.2	98.88
Works V1.2 Upg	79.71

If You Find a Better Price, Call CDW® Before You Buy (800) 861-4CDW

NASDAQ
BUY WITH CONFIDENCE
CDW® IS A NASDAQ TRADED COMPANY
TICKER SYMBOL CDWC
D & B Rated 4A1
Duns 10-762-7952

No Surcharge For Credit Cards

VISA DISCOVER MasterCard

Credit Card charges are not submitted until time of shipment. Freight is calculated as the carrier's actual freight charge plus insurance and packaging material The cost of insurance is 0.35% (0.0035) of the order total Packaging materials will not exceed $4.00 per 1 package order or $6.00 per multi-package shipment. For your protection we ship only to your verified billing address. Non-defective returns subject to restocking fee. Allow 10 business days for shipping when paying by personal check. Software, chips and other electronic components are not returnable. All pricing subject to change. ™ Trademarks of all companies listed in this ad.

CDW® HOURS
Sales 7:00 -9:00 CDT Mon-Fri.
9:00-5:00 CDT Sat.
Tech Support for Customers
8:00-7:00 CDT Mon-Fri.
9:00-5:00 CDT Sat.

Free technical support for CDW customers: 800-383-4239

COMPUTER DISCOUNT WAREHOUSE™

CDW

Monitors

E-MACHINES

T16II 16" color	1199.00
E20 20" color	1587.92
T20 20" color	2427.02

NEC

3V 15" flat sq	478.79
3FGe 15" flat sq	577.17
4FGe 15" flat sq.	629.81
5FGe 17" flat sq	996.50
5FGp 17" flet sq	1129.20
6FGp 21" flet sq	1999.00

MAGNAVOX

CM2080 14" .28mm	249.80
20CM64 20" .31mm	999.00

SONY

1430 14" trinitron	497.00
1730 17" trinitron	997.00
17se1 17" GDM-series tnnitron	1147.00

Radius

Monochrome 15" Pivot	563.65
Precisioncolor 15" Pivot	617.31
Precisioncolor 17" full pg	1233.96
20GS 20" mono dual pg	797.88
Precisioncolor 20" dual pg	1696.96
Intellicolor 20"	1922.29

RasterOps

Clearvue 15" mono full pg	397.06
Sweet 16" color full pg	934.32
21" mono dual pg	1068.76
20/20 20" color full pg	1497.82
21" color dual pg	2319.71
20T 20" color .30mm	2367.58

SUPERMAC

Supermatch 17T 17" color	1043.93
Pletinum 20" mono full pg	837.98
Supermatch 20+ 20" color	1658.36
Supermatch 20TXL 20" color	2447.99

Graphics/Video Boards

E-MACHINES

Futura II SX	297.71
Futura II LX	769.39
Futura II Ethernet upg	256.97
Ultura LX	1067.01
Simply TV	376.92
Powerlink Presentor	417.05

Radius

Precisioncolor 8XJ 8-bit	461.38
Precisioncolor Pro 24XP	445.28
Precisioncolor Pro 24X	1387.36
Photobooster 040/66	727.55
Powerview for PowerBook/Classic	489.82
VideoVision	1613.59

RasterOps

8XL 8-bit 1MB	456.53
8XLI 8-bit 1MB	829.92
24MX 24-bit 2MB	498.11
24STV 24-bit	717.15
24XLI 24-bit 3MB	1613.55
PaintBoard 8LI 8-bit 1MB	317.72
PaintBoard Lightning 24-bit 3MB	777.22
PaintBoard Turbo 24-bit 3MB 7"	1122.83
PeintBoard Turbo 24-bit 3MB XL	1127.89
PhotoPro	509.81
Moviepak2	1525.69
Mediatime	1525.69
CorrectColor Calibrator	1533.77

SUPERMAC

Spectrum/8 Series III	389.76
Spectrum/24 Series IV	797.64
Thunder/8	1119.27
Thunder/24	1697.02
Thunder 24 DSP upg	519.45
Thunder II Light	1746.97
Thunder II	2302.92
Thunderstorm for Photoshop	427.82
Supermatch Calibrator	348.20
Videospigot NuBus	363.39
DigitalFilm	2846.65

NETWORKING

ASANTÉ

AsanteView V2.2	218.36
10THUB 12 port 10BT +AUI/BNC	457.01
10THUB 8 port 10BT +BNC	209.88
AH1012 12 port 10BT +RJ21/BNC/AUI	829.92
SNMP Module-AH1012	262.00
AH1709 12 port 10BT RJ21/BNC/AUI w/bridge	2078.30
Asantelite LC-10T 10BT	102.84
Asantelite LC-TN Coax	109.06
Asantelite NB-10T 10BT	109.08
Asantelite NB-TN Coax	115.91
AsantePrint 1001 APL Bridge RJ45/AUI	327.89
AsantePrint 1002 APL Bridge AUI/BNC	334.23
AsantePrint APL Bridge RJ45/AUI	327.37
FN10TA Transceiver RJ45/AUI	55.40
FNIISITN Coax w/transceiver	229.16
FNIISITNMC 10BT w/transceiver	321.10
FNIITN Coax w/transceiver	196.53
FNTKA Transceiver AUI/AUI	65.25
FNTNA Transceiver BNC/AUI	61.80
MacLCTNIII Coax	149.81
MC+30IE64 Coax	149.81
MC+30IET64 10BT	149.81
MC+LCIII Combo	176.81
MC+SEE Coex	149.81
MC+SEET 10BT	149.81
MC3IISI Combo	196.53
MC3NB Combo	187.04
MC3SE Combo	196.53
McLC10TIII 10BT	149.81
MCLC10TMCII 10BT w/FPU	242.31
Mini EN/SC SCSI Combo	295.59
Mini EN/SC10T SCSI 10BT	234.16
EN/SC SCSI Combo	301.40
MR/LC Token Ring 16/4	392.95
MR/SE Token Ring 16/4	392.95

Dayna

Network Vital Signs	239.93
Netscope System bundle	599.22
SafeDeposit V1.3	79.35
SafeDeposit for AppleShere Servers	245.64
Daynaport E/LC Coax	111.09
Daynaport E/LC-T 10BT	103.58
Deynaport E/LC-A AUI	147.97
Deynaport E/LC-M Combo	184.26
Daynaport E/Z Combo	245.91
Daynaport SCSI/Link Coax	254.50
Daynaport SCSI/Link-T 10BT	254.50
Daynaport SCSI/Link-3 Combo	298.51
Deynaport SCSI/Link PB Coax	274.18
Daynaport SCSI/Link PB-T 10BT	274.18
Daynaport SCSI/Link PB-3 Combo	305.89
Etherprint APL Bridge BNC/AUI	336.90
Etherprint-T APL Bridge RJ45/AUI	329.02
Etherprint-3 APL Bridge BNC/RJ45/AUI	369.96

FARALLON

EtherWave AAUI Transceiver 10BT	103.54
EtherWave AUI Transceiver 10BT	103.59
EtherWave LC Adapt. 10BT	294.90
EtherWave LC-F Adapt w/FPU 10BT	183.80
EtherWave NuBus Adapt. 10BT	183.80
EtherWave Adapt. (PwrBk, Classic) 10BT	297.98
EtherWave Newton Adapt. 10BT	297.98
EtherWave Printer Adapt. 10BT	297.98
EtherMac LC-10T 10BT	103.50
EtherMac LC-10TF 10BT w/FPU	246.96
EtherMac LC-C Combo	178.31
EtherMac LC-CF Combo w/FPU	286.91
EtherMac LC-TN Coax	125.21
EtherMac LC-TNF Coax w/FPU	246.96
EtherMac SCSI-TN (Classic, Mac+) Coax	269.93
EtherMac SCSI-TN (PowerBook) Coax	282.06
EtherMac SCSI-TP (Classic, Mac+) 10BT	269.59
EtherMac SCSI-TP (PowerBook) 10BT	286.91
EtherMac SE-C Combo	161.49
Ether10-T transceiver RJ45/AAUI	68.19
Ether10-T trenseiver RJ45/AUI	68.19
LocalPeth V1.0 8 user	134.97
PhoneNET Connector DIN-8	28.74
PhoneNET Connector DIN-8 10pk	199.19

Communications/Modems

Global Village

PowerPort Bronze 2400 Int.	88.55
PowerPort Silver 9600 Int.	243.90
PowerPort Gold 14.4K Int.	273.34
PowerPort Mercury 19.2K Int.	314.37
TelePort Bronze 2400 Ext.	89.84
TelePort Silver 9600 Ext.	249.46
TelePort Gold 14.4K Ext.	273.60
Teleport Mercury 19.2K Ext.	314.37
GlobalFax Duo software	76.65

Hayes

Mac ACCURA 2400	75.76
Mac ACCURA 9600/FAX96	152.26
Mac ACCURA 14.4/FAX14.4	161.49
Mac OPTIMA 2400/FAX96	134.27
Mac OPTIMA 9600/FAX96	349.96
Mac OPTIMA 14.4/14.4 Pocket	316.18

PRACTICAL PERIPHERALS

Mac 14.4/14.4 FXMT	189.50
Mac 14.4/14.4 Pocket	314.59
Mac 14.4/14.4 FXSA w/LCD	404.87

Supra

Mac 14.4/14.4 w/LCD	219.40
Mac LC 14.4/14.4	153.20
Mac PowerBook 14.4/14.4 Int.	219.55

US Robotics

Mac Sportster 14.4/14.4	199.80
Mac WorldPort 14.4 Pocket	235.00

Storage Systems

FWB

FWB Hard Disk ToolKit	125.62
Hard Disk ToolKit Personal	49.95
PocketHammer 170MB	459.03
PocketHammer 240MB	534.91
PocketHammer 530FMF 530MB	994.23
PocketHammer 1000FMF 1.0GB	1179.48
PocketHammer 1600FMF 1.6GB	1789.46
PocketHammer 2100FMF 2.1GB	2319.04
HammerPB 210MB PowerBook Int.	604.44
HammerPB 340MB PowerBook Int.	644.42
Hammer 2000FMF 2.0GB	2579.64
Hammer 2100FMF 2.0GB	2355.46
Hammer 2800FMF 2.8GB	3149.88
HammerDisk 44MB Syquest	449.83
HammerDisk 88MB Syquest	613.18
HammerDisk 105MB Syquest	534.61
HammerDisk 130MB Optical	1099.95
HammerDisk 600MB Optical	2449.10
HammerTape 525MB External	937.50
SCSI JackHammer	619.30
SledgeHammer 2000FMF 2.0GB	2239.72
Hammer external enclosure	153.34

I-MEGA

MacFloptical 21MB	449.88
MacTransportable Bernoulli 90MB	339.42
MacInsider Bernoulli 150MB	499.83
MacTransportable Bernoulli 150MB	489.60

Micronet

C Pack 80MB	397.80
C Pack 120MB	386.46
C Pack 240MB	475.18
C Pack 155MB Tape Drive	729.87
C Pack 600MB Tape Drive	911.12
SS-240 240MB Ext.	492.99
SS-313 323MB Ext.	1069.88
SS-414 430MB Ext.	612.95
SS-540 540MB Ext.	1076.78

PLI

Infinity 88MB Syquest Int.	399.95
Infinity 88MB Syquest Ext.	489.90
Infinity 105MB Syquest Int.	357.10
Infinity 105MB Syquest Ext.	416.98
Infinity 270MB Syquest Int.	534.62
Infinity 270MB Syquest Ext.	614.61
Infinity 21MB Floptical Int.	317.72
Infinity 21MB Floptical Ext.	379.34
Ininlty 1.3GB MaxOptical Ext.	2828.23
Infinity 600MB MaxOptical Ext.	1435.09
Infinity 600MB Optical Ext.	2456.57
PLI 44MB Syquest Cart formatted	74.47
PLI 88MB Syquest Cert formatted	109.32
PLI 105MB Syquest Cart formatted	72.27
PLI 270MB Syquest Cart formetted	105.01

SCSI hard drives

Conner 343MB SCSI-2	335.99
Conner 1.0GB SCSI-2	885.62
Micropolis 1.05GB SCSI-2	869.72
Micropolis 1.05GB AV SCSI-2	919.75
Micropolis 1.75GB SCSI-2	1189.06
Micropolis 1.76GB AV SCSI-2	1239.53
Micropolis 3.0GB SCSI-2	2039.00
Seegate 1.0GB SCSI-2	858.22
Seegate 1.69GB SCSI-2	1589.60
Seagate 2.1GB SCSI-2	1546.38
Seagate 2.9GB SCSI-2	2149.65

Input Devices

CalComp

DrawingSlate series

6x9 corded pressure stylus	236.24
12x12 cordless 4B cursor	245.55
12x12 cordless 16B cursor	245.55
12x12 cordless pressure stylus	474.52
12x18 cordless 4B cursor	369.53
12x18 cordless 16B cursor	369.53

EPSON

Epson 800C Pro	1247.94

Logitech

Logitech MouseMan	63.80
Logitech TrackMan	49.88
Logitech ScanMan 32	258.20
Logitech FotoMan Plus	568.61

Microtek

35T Slide Scanner	1351.23
ScanMaker II	638.80
ScanMaker IIXE	1009.59
ScanMaker Auto Doc Feeder	369.54

Wacom

6x8 Artz ADB, cordless pres stylus	277.49
12x18 Standard, cordless pres stylus	972.95
12x12 Electrostatic, cordless pres stylus	714.70
12x12 UD-series, cordless pres stylus	507.59
12x18 Electrostatic, cordless pres stylus	997.74
18x25 Standard, cordless pres stylus	2554.28
Cordless 4B cursor	99.96
Cordless standard stylus	53.67

CD-ROM/Multimedia

Micronet CD-ROM 325ms	557.43
NEC MultiSpin 3Xe 195ms	558.92
NEC MultiSpin 3Xi 195ms Int.	479.90
NEC MultiSpin 3Xp portable	427.59
NEC MultiSpin 4X Pro	929.11
Pioneer 6 Disc Quadraspin	1149.00
Plextor DM5028 240ms	9999.00
Plextor DM3028 240ms Int.	9999.00
PLI CD-ROM 200ms	567.16
PLI CD-ROM 295ms Int.	389.32
PLI CD-ROM 320ms	411.36
Toshiba 3401 200ms	468.55
Toshiba 4 Drive Tower 200ms	2489.80
Media Vision PAS 16 NuBus	356.60
Altec Lansing ACS100 Spkrs	125.62
Altec Lansing ACS300 Spkrs/SubW	274.26
Yamaha 10watt Computer Spkrs	69.95
Yamaha Hello Music! MIDI	259.60

Printers

HEWLETT PACKARD

DeskWriter 550C	438.14
LaserJet 4ML	1056.52
LaserJet 4MP	1489.89
LaserJet 4M	1989.64
LaserJet 4Si MX	4508.36
DeskJet 1200C	2095.47

NEC

Silentwriter 640	788.58
Silentwriter 1097	1377.80

TEXAS INSTRUMENTS

microLaser Pro 600 PS23*	1374.71
microLaser Pro 600 PS65	1523.04

*After $60 manufacturer rebate

Power Backup

TRIPP LITE

BC250	99.11
BC400	149.59
BC500	189.42
BC500 LAN	199.40
BC600 LAN	249.00
Smart 250 LAN	232.46
Smart 400 LAN	279.87
Smart 500 LAN	309.09
Smart 600 LAN	334.91
Smart 750 LAN	428.53
Smart 900 LAN	625.64
Smart 1250 LAN	659.66
Isobar 4	38.95
Isobar 6	46.38

Performance Upgrades

Daystar

PowerCache 33Mhz w/FPU	357.03
PowerCache 50Mhz w/FPU	537.05
Value 040 33Mhz	926.12
Value 040 40Mhz	1089.22
Turbo 040 33Mhz w/FPU	907.30
Quad 040 w/128K	1247.48
Image 040 40Mhz w/128K, DSP	1629.85
FastCache IIci 64K	202.80
FastCache Quadra	295.83
Charger	483.43
Charger Plus	537.46

Memory Upgrades

CDW carries Macintosh-compatible memory upgrades from Technology Works, Kingston, Simple Technology and more.

Call today for the best price!



Sony GDM17se1
Breakthrough Design!

☆ 33% flatter than CPD displays ☆ .25mm aperture grille pitch ☆ On-board diagnostics ☆ All digital controls ☆ Refresh up to 100Mhz @1024x768 ☆ Max. Resolution 1600 X 1200 @ 60Hz ☆ Energy Star and MPR II compliant

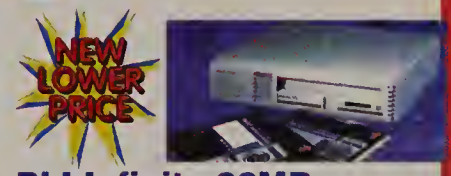
ONLY! ..... **$1147.00** CDW 33216
CPD 1730 ..... **$997.00** CDW 28890
CPD 1430 ..... **$497.00** CDW 26660



PaintBoard Lightning

The latest price-performance addition to the RasterOps family of color display adapters. This 24-bit adapter features proprietary hardware and software-based acceleration, and will bring increased productivity to all your favorite applications.

ONLY! ..... **$777.22** CDW 34670



PLI Infinity 88MB Removable Media Drive

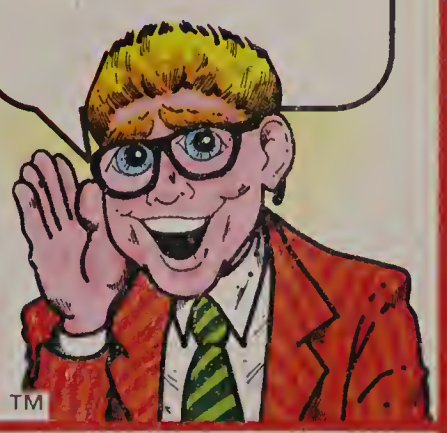
✔ Uses industry-standard 5.25" Syquest media ✔ Reads and writes to 44MB and 88MB Cartridges ✔ 20ms average access time ✔ 2 year warranty

ONLY! ..... **$489.90** CDW 37097

PLI 88MB formatted cartridge w/ 5 year warranty

..... **$109.32** CDW 37105

Mac Deal$ *says:*
"If you've seen a better price, call us before you buy--because **CDW** *is* ***DEALIN!"***



TM

CDW® YOUR COMPLETE SOURCE FOR HARDWARE & PERIPHERALS

IF YOU DON'T SEE IT... CALL!

CDW® Sells for Less and Services You Better!

800 861-4CDW

FAX (708) 465-6800

©1994 CDW® Computer Centers, Inc. MW939

CALL TODAY FOR OUR FREE MACINTOSH CATALOG.

Macs in the Movies With the right equipment, a high-end Mac or two become the heart of a film or TV studio's postproduction facility. The author's studio (shown here) uses a Quadra-based system to produce commercials and short films.



VIDEO-EDITING TOOLS

How to find the Mac tools that meet pro standards

Although the Macintosh has brought revolutionary changes to diverse professional fields—publishing and music, to name but two—video production remains an elusive target. Barely a year ago, still in its infancy, video on the Mac meant watching a stuttering QuickTime movie the size of a Sony Watchman.

Now, thanks to better compression algorithms and dedicated compression hardware, the infant has grown into a precocious child—walking and talking full-screen (at 640-by-480-pixel resolution) in real time (30 frames per second, or fps). Equally important innovations are happening on the front end, as a growing number of sophisticated Macintosh editing and effects tools become available. Finally, high-quality I/O signal-processing technology is building a better gateway from the Mac's RGB environment to the analog and digital video formats used by professional video editors.

The technology's progress is so encouraging that even the high priests of traditional postproduction—the keepers of the broadcast waves—have finally begun to read the binary on the wall. And at less lofty levels, the benefits are here now for advertising agencies and others who need to produce video proposals quickly and at relatively low cost.

BY AVI HOFFER



MARK JOHANN

Presentation Picks The encoder boxes used by the RasterOps MoviePak2 Pro Suite (top) and the Radius VideoVision Studio produce high-quality videotapes.

Many people don't need the highest-level systems. For example, if you produce in-house video proposals, presentations, or the like—what we call corporate video—several lower-priced systems are available that offer decent quality. And you can expect the professional-level technology to migrate down to more affordable systems, so you'll eventually get the high quality the pros have now.

Whatever your needs, chances are there is a tool that can help you. I tested three video-editing bundles—from Radius, RasterOps, and SuperMac Technology—by using them on real video projects to see what they can really do, starting from the simplest product to the most sophisticated. Because the promise of marrying computers and video production lies in the ability to manage video, I've covered only *nonlinear* systems—those that let you work with different video clips, in any order. (These random-access systems differ from linear systems in the same way that hard drives differ from sequential-access tape drives.) Most systems covered here are *offline*, which essentially means that the Mac records the instructions on how to assemble the video in an *edit-decision list* (EDL) and then assembles the completed video on tape based on those instructions. Offline systems require fewer resources than *online* systems, but online systems let you create high-quality video directly, without assembling on tape separately.

To see if there's a system that matches your needs, read on.

Presentation Video

The establishment of the JPEG (Joint Photographic Experts Group) standard for image compression spawned the first generation of affordable NuBus compression cards for full-screen image capture and full-motion playback. These are particularly suited for presentations and other multimedia work where the image will be viewed on a computer screen.

JPEG technology is far from being a digital video panacea—the "standard" is not universal, and full-screen QuickTime movies don't always play back with the codecs (coder/decoder) used in other companies' products. (For example, a movie created with a SuperMac codec may not play back smoothly with a Radius codec.) Still, JPEG has a wide compression-ratio range, it can randomly access individual frames of video (letting the Mac deal efficiently with large quantities of time-based media), and it has become more economical.

SuperMac Technology's Digital Film ($3799, 408/541-6100) was the first of the video-editing products with JPEG compression boards to ship. Plagued by early digitizing and playback problems, Digital Film version 1.5 has been retooled to deliver 60-field interlaced playback (in the United States' NTSC IV standard, video has 2 fields per frame and 30 frames per second; the use of two fields per frame is called interlacing) and visual quality comparable to VHS videotape.

Just recently, RasterOps packaged the 60-field MoviePak2 Pro Suite ($4199, 801/785-5750), which includes the 24XLTV display adapter, a MoviePak2 compression daughtercard, and the Video Expander II RGB/NTSC encoder box. (This suite replaces the earlier 30-field Editing Aces Suite.) Radius was the last to enter the video-editing fray, with VideoVision Studio ($4499, 408/434-1010). Apple also sells two video-editing systems that repackage many of the products covered here (see "Apple Video/Media Bundles," *News*, *Macworld*, April 1994).

With the appropriate software, these compression cards function both as off-line, nonlinear editing engines and as video processing/compositing systems.

Image quality The Radius VideoVision Studio was the first product to deliver all 60 fields of interlaced video per second (earlier products captured every other field and interpolated the missing one), and it still maintains the best overall picture quality of the three systems I tested.

The MoviePak2 closely rivals the VideoVision's picture quality, plus the MoviePak2 has the advantage of modular construction, better controls over and quality of JPEG compression, and support for 24-bit color on monitors as large as 19 inches. In fact, the MoviePak2's software is simply better designed and implemented, which results in higher quality, more flexibility, and increased control. While the MoviePak2 Pro Suite doesn't come with any on-board audio support (RasterOps assumes you will use the built-in 8-bit audio that comes with most new Macintosh models), you can configure the system with RasterOps' $999 MediaTime or with a third-party board to get 16-bit, CD-quality audio.

SuperMac's Digital Film falls behind both the RasterOps and Radius products in terms of picture quality (it is limited to 320-by-480-pixel capture and doubles the 320 horizontal pixels to 640). But it comes with a better software bundle—Adobe Premiere, Diaquest's DQ TimeCoder, Macromedia's Director, and CoSA's After Effects 1.1 (the latest version is 2.0).

No matter which product you use, note that on-screen picture quality varies along a spectrum depending partly on the resolution of the source video and partly on the amount of compression chosen. Not surprisingly, color bleeding and signal noise visible in multigeneration video material is made worse by JPEG compression. The best digitizing results come from the first-generation Y/C output of SVHS, Hi-8, and newer Betacam video recorders, which reduces cross-talk distortion among colors. But better input, better output is the rule only up to a point: even at maximum quality settings, for example, output from even the VideoVision Studio or MoviePak2 never exceeds the image quality of ¾-inch SP videotape (a format, often used by professionals, with twice the resolution of VHS videotape). The SuperMac card falls short of that mark.

Playback integrity fluctuates according to several factors, including hard drive speed, RAM allocation, and the number of enabled system extensions (INITs). Even with a Quadra 950, 64MB of RAM,

and a speedy 2.2GB disk array, frames drop out here and there. (This is most noticeable in lip-synced footage, which I've found tends to get the most reliable playback on the widest variety of Mac configurations when digitized and played back at 320-by-240-pixel resolution.) The MoviePak2 uses an adaptive compression feature called DynamicQ to get the best balance between visual quality and constant data flow; this minimizes the number of frames dropped.

Using these cards to send edited video back to tape hides some of the imperfections caused by compression; the artifacting around object edges and areas of saturated color tends to get masked by the videotape recorders' lower NTSC resolution. Of the three products, Video Expander II of the RasterOps MoviePak2 Pro Suite is the best NTSC encoder: its genlock capability, adjustable subcarrier, and horizontal phase settings help deliver a clean, stable output signal. The Expander's signal-timing adjustments also make it possible to integrate a Mac into a larger studio environment, which typically requires such fine-tuning controls.

The Radius VideoVision Studio's convolution technology results in flicker-free output, but the trade-off is a slightly softer focus and less horizontal and vertical blanking integrity—important considerations for broadcasting or tape duplication.

All this pixel-splitting aside, be advised that only under optimum conditions—low compression rate plus blazing CPU and hard drive speed—can you achieve more than decent VHS-quality output. Consequently, for professional video production, these products are mainly offline tools for organizing images and ideas.

Editing As editing systems, all three products suffer from the same malady: amateur editing software. All are bundled with Adobe Premiere, which—for all its popularity and excellent effects-generating features (see "Video Production Techniques," in this issue)—cannot be considered a serious editing tool.

First, Premiere lacks the sophisticated trim functions and shot-management strategies that professional editors demand. For example, to cut matching action, editors need to see the outgoing and incoming frames on a cut and easily adjust the frame marker without waiting to build a preview. Premiere version 3.0 goes a long way toward accelerating preview and effects construction, but it still takes more time than professionals have to give.

Second, Premiere's insert and splice commands are click-and-drag oriented; there are no alternative ways to manipulate an edit with numerical keyboard trims, as professionals would expect. For

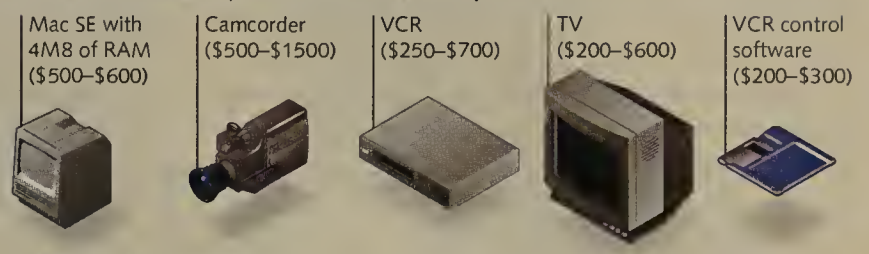
Editing Video: Which Tools Do You Need?

by Jim Feeley

BASIC TAPE EDITING

Your Goal
To use your Mac as a control device to organize video footage into finished tapes. (You don't need to create special effects or add titles in the video.)

What You Need (cost: $1650–$3700)

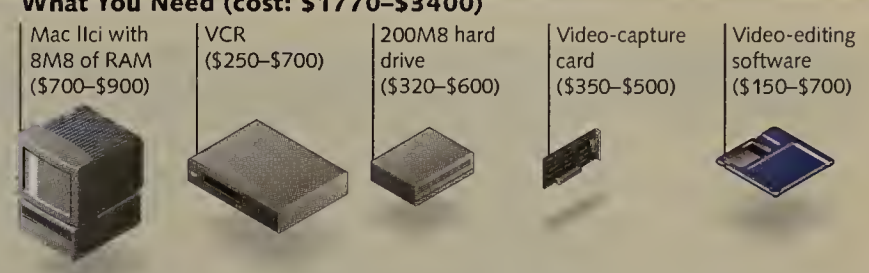


Recommended Products Software: VideoToolkit (Abbate Video, 508/376-3712).

MULTIMEDIA VIDEO

Your Goal
To get video footage into a Mac for use in multimedia presentations or for creating CD-ROMs. (You don't need full-screen 30-fps video. You don't need to output the finished product to videotape.)

What You Need (cost: $1770–$3400)

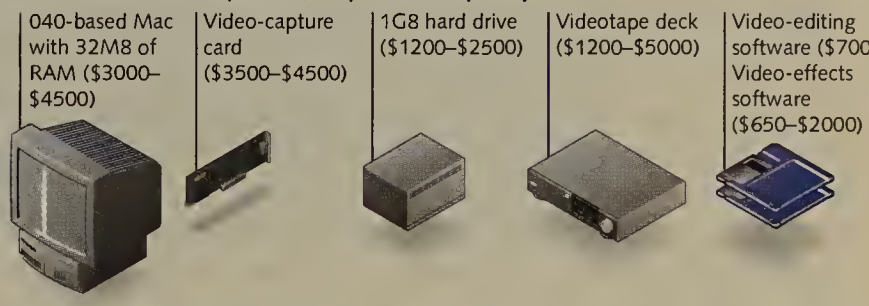


Recommended Products Hardware: MovieMovie (Sigma Designs, 510/770-0100) or VideoSpigot (SuperMac, 408/541-6100). Software: QuickFlix (VideoFusion, 419/891-1090), VideoShop (Avid Technology, 508/640-6789), or Adobe Premiere (Adobe Systems, 415/961-4400).

CORPORATE VIDEO AND EFFECTS

Your Goal
To use your Mac to produce videotapes with titles, sound, and special visual effects for use in training tapes, presentations, proposals, or other work requiring just moderate display quality.

What You Need (cost: $10,250–$19,200)



Recommended Products Hardware: VideoVision Studio (Radius, 408/434-1010) or MoviePak2 Pro Suite (RasterOps, 801/785-5750). Software: VideoFusion (VideoFusion, 419/891-1090) or After Effects (CoSA, 401/831-2672).

OFFLINE BROADCAST VIDEO

Your Goal
To produce programs, with a Mac-based system, for broadcast television. You need to control multiple audio and video sources while maintaining the high quality of those sources. You also need to see the results of your edits and special effects immediately, since you have large amounts of footage and a very tight deadline.

What You Need (cost: $28,150–$105,300)



Recommended Products Systems: Media Composer 400s (Avid Technology, 508/640-6789), Media 100 (Data Translation, 508/460-1600), or VideoCube (ImMix, 916/272-9800).

example, split edits—transitions where audio from a clip comes in before the picture—are technically possible but not easy to manage in Premiere. Also, Premiere offers no simple methods for relocating audio sync after its link with the picture is broken.

Moreover, Premiere's playback accuracy and time-code addressing are often inconsistent, due to some frame-addressing anomalies within the application and to data bottlenecks in communicating with the compression hardware.

Still, the addition of time-code support in Premiere has at least made offline editing possible. When used with a videotape recorder's control plug-in such as Abbate Video's VideoToolkit Plug In Pack ($99, 508/376-3712) or Pipeline Digital's ProVtr ($99, 808/235-0335), Premiere even supports batch digitizing with RS-422 serial port–compatible control and time-code capture for videotape recorders (in either SMPTE format for North America or EBU for Europe). This feature is important if you later want to export an edit list and assemble an edited master at an online editing facility.

Although Premiere is not ready for prime time from a professional-editing standpoint, it certainly has taken some of the mystery away from postproduction, and it has exposed more people to basic video-editing concepts than any other mass-market product.

Special effects Premiere really shines when creating effects. Its plug-in architecture offers ever-expanding possibilities for producing exciting digital video effects. When used with either CoSA's After Effects (401/831-2672; version 2.0 costs $1995; version 1.1 is bundled with Digital Film) or VideoFusion's VideoFusion (bundled with VideoVision Studio; $649; 419/891-1090), any one of the JPEG cards is transformed into a resolution-independent video-effects workstation featuring complex rotoscoping tools, traveling mattes, alpha-channel compositing, multiple layering, filtering, and image distortion. All three effects packages introduce subpixel motion and field rendering, which smooths out a lot of the sizzling problems associated with swift movements in computer animation.

CoSA has increased the precision of the image and motion controls in After Effects 2.0, letting the user compose animation and effects as a sum of composited image layers; the layers can all be matted, filtered, and altered independently with a powerful keyframe interface.

VideoFusion has a gentler learning curve, but it deals only with two images and one effect procedure at a time. It does, however, sport some unique effects, such as dynamic morphing, flex-warping, and time-based filter controls. VideoFusion also has fast thumbnail-image previewing, which lets you quickly set up effect parameters and get immediate feedback.

Even though After Effects seems to be aimed at advanced users and VideoFusion positioned as an entry-level product, I recommend both packages together as complementary production tools, despite the fact that some features overlap.

The only downside to all this digital manipulation is the rendering time involved in building an effect. Even on a Quadra 950, certain Premiere transitions can take 20 to 30 minutes to render; and a 10-second After Effects project using some rotation and multiple filters can take many hours. While this kind of rendering time is perhaps tolerable in multimedia production (where the total amount of motion video is relatively small), most video postproduction work demands even faster turnaround.

VideoFusion now supports Yarc Systems' NuSprint graphics accelerator card ($2495, 805/499-9444), which increases performance up to 300 percent. CoSA is also working on better rendering strategies. But for the time being, unless more time than money is available, most professional effects will continue to be pro-

BEST OPTIONS FOR VIDEO LOGGING

For an independent producer working project to project, a costly investment in postproduction equipment may be inappropriate. Even so, there are still ways to save time and money no matter what production environment you find yourself in.

As the shift to nonlinear digital editing progresses, the need for good logging and shot-organizing habits becomes more critical. Efficient logging saves you time in the editing room, and since you identify unnecessary footage before you digitize, you also save valuable disk space.

One such low-cost productivity tool is Pipeline Digital's AutoLog ($195, 808/235-0335), the full-featured version of the ProVtr plug-in for Adobe Premiere. AutoLog has excellent RS-422 deck control and supports both EBU and SMPTE time codes. AutoLog formats clips into a text file—it will even capture thumbnail reference frames if a video-capture card is installed. Its word processor style has made it a very popular tool for transcribing interview footage. AutoLog exports logs in a variety of formats, including ImMix's VideoCube and Avid's Media Composer, for easy batch-digitizing.

Another option is Abbate Video's VideoToolkit ($279, 508/376-3712). VideoToolkit is a smart little application with some limited editing capabilities. It runs on almost any Mac and can control an extremely wide range of professional and nonprofessional video decks (even camcorders). With a digitizing board it even supports QuickTime, giving the program some of the editing functionality of Adobe Premiere at less than half the price.

Organizing and logging material is the first critical phase of postproduction, and VideoToolkit lets you accomplish this task with nothing more than a PowerBook and a consumer-quality VCR. You can do your logging and organizing in a plane or hotel room the night after a shoot and walk into an editing session the next day with all your shot selections on a floppy disk. The time saved in one production could easily pay for this product. While I am not a big fan of its HyperCard-like interface, the broad deck support makes VideoToolkit a good choice for industrial and educational use.

Sundance Technology Group makes a product called Q-Base ($675, 214/869-1002) that offers stronger on-board database features than the other two products (which offer only tab-delimited text export to a stand-alone database application). Q-Base has a professional job template with customizable fields. The application keeps track of media and time-code types (LTC, VITC, or control track) in addition to the usual clip information. Q-Base does a decent job of searching multiple logs to find clips, but it doesn't have the multiparameter search features of most database applications. The RS-422 deck control also seemed somewhat sluggish. Q-base does support the ADB deck controllers made by JLCooper Electronics (Media Control Station $269.95; CS-1 Control Station $499.95; 310/306-4131).

Choosing the right logging application for your needs could be the first important step in bringing your production techniques up to speed. The first time you find a critical close-up in a mouse-click, rather than in panicked searching through hours of footage, you'll wonder how you ever worked any other way.

duced on higher-end, dedicated machines even at their exponentially higher cost.

Corporate Video

Companies seeking to produce in-house videotapes, or agencies seeking to create good-quality proposals and comps, can select from several professional-quality production facilities built around a Mac engine. These systems tend to be expensive from a typical computer user's viewpoint, but they're much cheaper than traditional video-editing systems.

Avid options The Media Suite Pro from Avid Technology ($9995, 508/640-6789) is a bundling of a NuVista+ JPEG card, an Audiomedia II card, and an ATTO Technology SiliconExpress SCSI-2 card with Avid's highly regarded editing interface, excellent trim functions, digital/analog audio scrub, and shot organization features. It has a loyal legion of editors humming sweet songs of praise.

Media Suite Pro's trim mode visually opens up the edit point, so that the editor can add or subtract frames while having constant visual feedback on how the end frames fit together. This feature makes it a pleasure to cut matching action.

Media Suite Pro is designed to edit nonbroadcast projects (such as corporate and promotional materials) from start to finish, exporting the final piece directly to tape. It supports A/B transitions and such effects as picture-in-a-picture and slow motion, it lets you edit four CD-quality audio tracks separately or locked in sync, and it fully automates the reestablishment of broken audio sync.

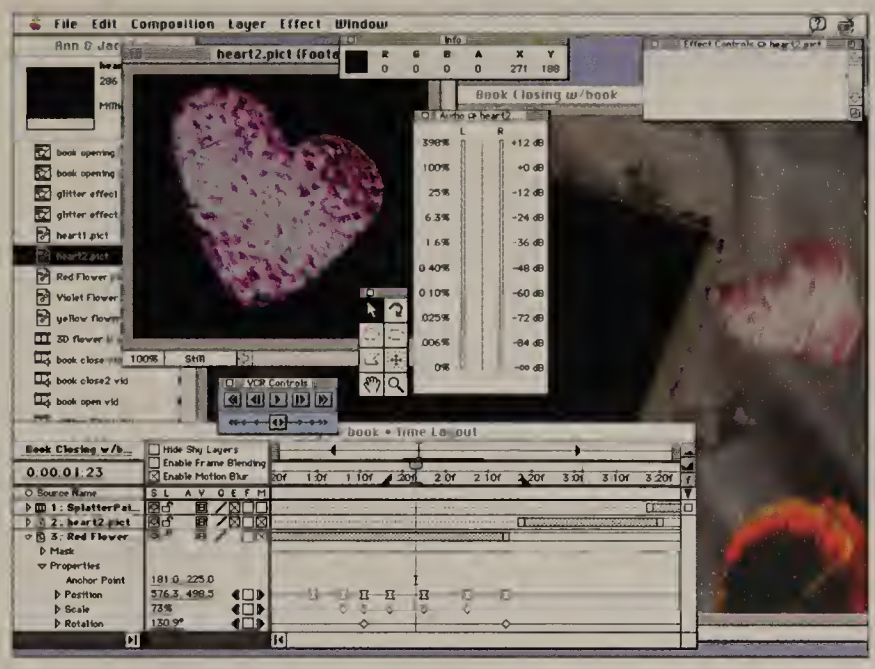
Media Suite Pro also has proprietary AVR5 (30-field) and AVR25 (60-field) image compression. The image quality is clean enough for most industrial use.

The recent addition of an EDL option ($995) makes Media Suite Pro viable as an offline system, although some of the most useful editing features found in the higher-end Avid systems are unfortunately missing. For example, the time line uses only keystroke commands, while almost every competing interface (including Avid's own Composer 5.0 software) also lets the user move clips around with the mouse. The lack of draggable clips seems peculiar, considering that the product is aimed at a less-sophisticated market that might prefer to work with clips graphically rather than with frame counts and in/out points.

A true offline system at the same price point is Avid's Media Composer 400s ($14,995). Running on a Mac IIci or better, the 400s is an entry point to Avid's popular Composer product line and is suited for most kinds of long- and short-format editing (such as music videos, documentaries, commercials, and features). The basic configuration supports only AVR1 video compression (30 fields per second of low-resolution images). This means lower picture quality, albeit much smaller storage requirements: up to four hours fit on a 2.2GB drive. Beyond the core Avid editing features, the 400s offers EDL support and handles up to four video tracks for mixing complex images.

Another distinction is that the Media Composer series provides a modular upgrade path, while the Media Suite Pro does not. For $4000 to $5000 per module, you can add such features as 24 tracks of audio or AVR2 video compression.

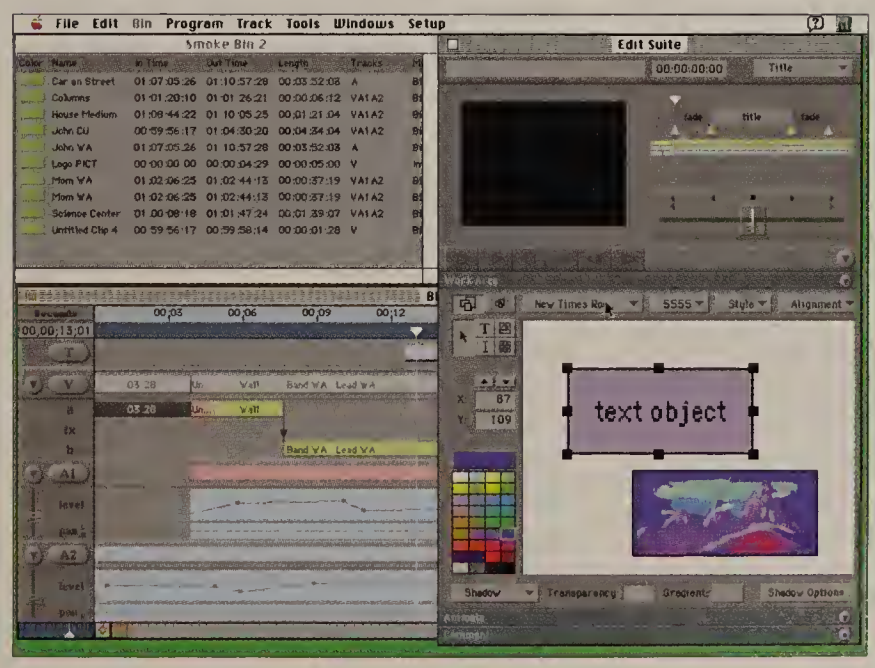
The deluxe offline system is Avid's Media Composer 800 ($49,995), which



Precision Effects CoSA's After Effects 2.0 has expanded the precision and power of its 2-D animation and effects. The number of tools and elements available on screen means that After Effects works best in a dual-monitor configuration.



Multiple Images Version 5.0 of Avid Media Composer's software offers tools to control the display of windows within the video image, including settings for the windows' borders. Each window has its own time line, or track.



Video Titling Data Translation's Media 100 offers text tools for placing words and illustrations over the video—useful for adding captions or subtitles.

THE LINEAR ALTERNATIVE

While nonlinear editing systems have been grabbing all the postproduction limelight of late, linear systems and hybrid systems will continue to have an important role for some time. To this end, a German company called Fast Electronics U. S. (508/655-3278) has created an important low-cost solution for lower-end professionals. Starting at $4995 (the studio version is $6995), the Video Machine is similar to NewTek's popular Amiga-based Video Toaster. The Fast machine provides high-quality analog switching with editing and shot management.

Although the software (version 1.0) could lose some clutter in its interface, the openness of the system should make it very attractive to Macintosh users. In many ways, the Video Machine is what the short-lived Video F/X system made by Digital F/X should have been: it offers on-board time-based correctors, dual-frame buffering, six video inputs, multiformat support, and Y/C in/out—all in a cost-effective package.

In a radical departure from current trends, Fast has omitted character- and graphics-generating modules, opting instead to let users choose applications (such as Photoshop, Premiere, or Painter) for creating graphics. You can even design your own custom wipes (a CD-ROM containing many examples comes with the Video Machine) and bring them into the system.

Fast is also working on a nonlinear component to the Video Machine that promises to further enhance its flexibility. Keep watching this rapidly evolving product.

supports AVR1e through AVR3e compression (the *e* stands for enhanced compression ratio). The 800 comes complete with a Quadra 950, two 14-inch multisync monitors, Roland speakers, and a 2GB hard drive. In addition to the standard Avid features, the 800 supports more special effects and motion effects, interlocked footage grouping for multicamera editing, and 24-track audio.

The other members of Avid's Composer line are the Film Composer ($69,995), the Media Composer 1000 ($49,995), the Media Composer 4000 ($75,995), and the Media Composer 8000 ($89,995). The Film Composer allows 24-fps editing and generates a cut list for negatives; the Media Composer 1000 is Avid's midrange offline/online system, positioned to compete against some of the lower-cost high-resolution systems while maintaining an upgrade path to the Media Composer 4000 and 8000 systems (two full-featured digital online systems that use 60-field AVR25 compression to preserve the highest image quality).

Real time, real value Britain's Carlton Communications plc is no stranger to video; it owns several high-profile companies, including graphics innovator Quantel and analog-editing giant Grass Valley Systems. Carlton's foray into digital video has produced the ImMix VideoCube ($40,500; 916/272-9800), an online, nonlinear workstation that uses a Macintosh as a front end.

ImMix engineers have solved some of the daunting data-compression and throughput hurdles by bypassing the Mac entirely and using a proprietary RISC-based processing unit to crunch numbers at staggering speed. The VideoCube comes complete with video processor, storage module (enough for one hour of video and two hours of CD audio), speakers, and Quadra 650.

The result is the first truly high-quality, real-time effects processing at a price that most professionals will find very affordable. Relieved of the burden of pushing around all that video data, the Mac is free to do what it does best: manage the media in an editor-friendly environment.

The VideoCube uses a straightforward time-line approach—with one video track, one graphics track, and four audio tracks—with floating palettes for all the audio- and video-processing parameters. The system displays the video program as a full-resolution NTSC image so that the user can always monitor final output quality. The manual jog shuttle is a nice bonus for traditional editors (who tend to work faster without the keyboard and mouse), and the audio faders are great for making on-the-fly adjustments.

The VideoCube is powerful and easy to use, although in this early incarnation the hardware seems to be waiting for the software to catch up. It has a nice split-screen trim option, but the time line lacks some finesse; for example, it doesn't offer multiple video tracks or stronger split-edit support. Also, a second offline resolution option (like what Avid's Media Composer 1000 offers) would make the system amenable to a wider variety of editing situations. A more graceful keyframe system for audio mixing and effects would also be welcome.

The VideoCube's proprietary media-storage modules ($5000 per module) mean the cost per minute of storage is higher than the market rate—a tough swallow for the Mac hack used to choosing among several hard drive manufacturers.

Budget online The dark horse to watch in this pack is Data Translation's Media 100 ($11,995; 508/460-1600). Although the product is fairly new, its price/performance analysis was very impressive in my testing, despite some shortcomings. The Media 100 is a two-card solution that offers four tracks of 16-bit audio and 60-field image quality that rivals that of the VideoCube.

The Media 100 implements optional support for Adobe Premiere plug-in effects technology, with some on-board acceleration to reduce rendering times (the effects option costs $995). The interface uses the multitrack time-line approach and source-bin metaphors common to most of the systems previously mentioned; but the Media 100's time-line interface benefits by always being in WYSIWYG mode, and its editor works with a full-screen, high-quality image on an NTSC monitor. These features go a long way toward making nonlinear editing a transparent experience for the editor's clients: all they know is that their program is being assembled very, very quickly.

The Media 100 has keyframe audio settings modeled after Adobe Premiere's so you can do sophisticated audio mixing right on the time line. The Media 100 also supports various digital resolutions within the same program—a useful feature that neither Avid nor ImMix has yet implemented. With multiple resolutions, the editor can work in a low-resolution offline mode but can digitize particular shots—wide vistas, for example—at higher resolution when detail is important. Offline use is more practical with the EDL option ($995), but the version I used produced erratic results.

Although the Media 100's layout is very approachable and easy to navigate, some precision-trim features are lacking. For example, the absence of any strategy for split-screen cutting makes matching action laborious, and the inability to edit using time lines (in analog editing, record time codes) in trim mode and the lack of auto-resync limit the 100's flexibility.

The Media 100 supports QuickTime better than other systems do. Another feature that will appeal to Mac-savvy bargain hunters is the flexibility of the storage media. The Media 100 will run with a variety of economical, off-the-shelf SCSI drives, as long as they have a sustained data throughput of 3MB per second and an access time of 11ms or better.

From Disk to Airwaves

The difference between what is broadcastable (that is, legal under the Federal Communications Commission's RS-170A rules) and what is of professional studio quality is complicated. Broadcast producers ultimately expect a finished product with the most pristine image possible. Moreover, professional video engineers and the FCC are a picky lot. Walk into a TV station with a program produced directly from disk and you'll get a lecture in a seemingly foreign tongue about IREs, vertical blanking, subcarrier phase, and graticule amplitude—an ancient, analog lexicon that predates computer jargon.

Even at 60 fields per second, most of the systems covered in this article are not ready to handle the exacting standards of most commercial broadcast work—although that day is rapidly approaching. Today, Avid Technology's Media Composer 4000 and 8000 systems come the closest to meeting that high standard. For now, nonlinear online material is largely coming in through the back door—promos, infomercials, and other short-form work. But time-sensitive programming like news and sports are beginning to turn to Macintosh-based nonlinear solutions to meet their tight deadlines. Within a year or two, improvements in image quality and in media storage should be available to satisfy even the most demanding professionals.

The benefits of a complete Mac-based postproduction facility are many. The possibility of seamlessly combining audio, animation, graphics, text, and effects with video sources in a Macintosh environment is one attraction. This is certainly the vision implied by the Avid-led (and VideoFusion-supported) push to define an industry-standard Open Media Framework Interchange (OMFI) that not only provides protocols for porting various types of digital media among applications, but also includes descriptive data that represents how the media is organized and how a program is to be played. Using inexpensive networking technology, extremely fluid and efficient postproduction environments could be created, whereby projects flow from different workstations without ever leaving the digital nest. However, until the industry hammers out a true standard—be it OMFI or something else—QuickTime remains the de facto digital video conduit on the Mac.

Another attraction to Mac-based postproduction is economy. An integrated nonlinear online system costing between $100,000 and $200,000 can be more versatile and efficient than traditional analog setups that cost upwards of $500,000.

Making a Choice

Right now, choosing the Macintosh platform for video production work means bearing with some evolving technology. A Mac system may cost more up front than an Amiga- or PC-based product (such as NewTek's Video Toaster, TouchVision's D/Vision, or EMC's Primetime Editor). But the payoffs are usually more-versatile product features; compatibility with a large, existing base of graphics and animation software; and in several cases, a superior interface.

For multimedia, the Mac is definitely the place to be, and producers have already discovered the benefits of relatively inexpensive JPEG compression cards.

For offline video postproduction, some real breakthrough products have been established, and more are on the way. The online solutions aren't as mature, but many corporate and industrial producers can't afford to wait.

For a multimedia company or an advertising agency roughing out ideas, a lower-priced JPEG card with Adobe Premiere may be completely adequate. A budget-minded documentary filmmaker will probably be happy with the flexibility of the Media 100. A large postproduction house might want to invest in various models in Avid's Composer line to maintain maximum compatibility, while a smaller postproduction facility, production company, or corporate-media department might be interested in the versatility and price of the VideoCube.

The best advice is the same given in any technology-intensive endeavor: stay modular, keep the upgrade path open, and maintain compatibility with established industry standards. Make sure you have adequate methods of getting your work back out to a variety of formats with minimum hassle. And make sure you have the storage capacity and horsepower to work effectively. Nothing will be gained by forcing a Mac IIci to process a special effect at film resolution. On the other hand, a PowerPC-based Macintosh may not be necessary to do low-resolution offline editing for cuts only. (Also note that most video-editing hardware vendors seem to be waiting for the second generation of Power Macs before adapting their products.)

While it may never truly become the video equivalent of PostScript in the desktop publishing world, QuickTime certainly has given birth to a more elastic media paradigm and opened a wide frontier. Traversing that vast territory is a challenge requiring fluency in both video and computer dialects. One thing is certain: just as Edison's infant kinetoscope matured into the motion-picture industry, we can count on the toddler QuickTime (the modern-day equivalent of the kinetoscope) giving way to enormous technological advances and the growth of a major industry. Growing pains aside, the future looks to be a wild ride on the crest of the telecommunications wave. **m**

AVI HOFFER, who writes frequently about Mac-based video-editing systems, runs Red Herring Pictures, a postproduction house in Hollywood.

Additional reporting by JIM FEELEY.

PROFESSIONAL VIDEO EDITING

MW EDITORS' CHOICE

Because there are several distinct markets for video-editing tools, we chose the top products for each of those markets. To select the best, we focused on high-quality output and ease of use. Because broadcast-quality tools are just emerging, we have no Editors' Choice in that category.

Presentation Video

VideoVision Studio While other systems have a component or two that are better than those in VideoVision Studio, this Radius system delivers the best image quality overall and has a strong set of tools for capture, effects, and output. **Company:** Radius. **List price:** $4499.

MoviePak2 Pro Suite This set of products offers high image quality. By substituting a MediaTime board for the suite's video card, you also get 16-bit audio support. **Company:** RasterOps. **List price:** $4199.

Corporate Video (Offline)

Media Composer 400s A good, core system, the 400s offers support for complex image mixing. Its modularity means it can be upgraded to Avid's higher-end video-production systems. **Company:** Avid Technology. **List price:** $14,995 (excluding cost of Mac).

Corporate Video (Online)

VideoCube Using a Quadra as the front end gives this system the horsepower to do professional work while offering the ease of use of a graphical interface. But beware the proprietary storage modules: they're expensive. **Company:** ImMix. **List price:** $40,500.

"All he left me was this guitar, a hound dog, and a broken heart."

Why is it that some software companies remind you of country music? Is it because their love lies elsewhere?

Not so at WordPerfect®. New WordPerfect 3.0 says we're completely faithful to the Macintosh® platform. In fact, when Apple® introduced the Power Macintosh, we were there—running native. That "Windows™ company" wasn't.

We're also committed to new features. Macintosh features. Like customizable button bars that put your most-used commands right in front of you. And new ruler bars that let you do everything from change layouts and styles, to create tables at the click of a mouse. They even give you direct access to our sophisticated drawing tools and grammar checker.

Accelerated for Power Macintosh

We were first to support QuickTime. First with AppleScript. WorldScript. PowerTalk. And now the Power Macintosh. Are you sensing a theme here?

Now you can express yourself for just $99*. Why such a bargain? Because we love the Mac. And we'd never leave it. Besides, our pickup truck is busted.

$99* (800) 526-7820

Competitive Upgrade. Visit your local reseller or call us.

WordPerfect® macintosh®



Video Production

TIPS FOR CREATING TOP-NOTCH QUICKTIME VIDEOS

Techniq

Since its introduction in 1991, QuickTime video has been a featured Mac attraction. The list of products for capturing, editing, and adding special effects to video has grown to number in the hundreds. Used effectively, QuickTime video can add an element of interest to a presentation, offer real-world examples in a training application, or in some cases provide a replacement for tape-based video.

Whether you're editing a full-motion, full-screen feature film or a postage-stamp–size window on the world, you can take advantage of production and editing techniques that make your work easier and make your results more professional looking.

To show you these techniques, I will use examples from Adobe Premiere version 3.0 from Adobe Systems (415/961-4400) as the video-editing software. This latest version of the popular Premiere adds several new features and enhancements, including support for third-party hardware accelerators for movie previews. For video capture and output, I used the Editing Aces Suite from RasterOps (801/785-5750), which includes a MediaTime card, a MoviePak JPEG accelerator daughtercard, and a Video Expander II breakout box for NTSC video output. This package allows real-time video capture and playback with 16-bit CD-quality stereo audio. The card set captures a 320-by-240-pixel image at 30 fields per second, which is good enough for most on-screen video and for many videotape presentations. (Editing Aces was recently discontinued. The feature "Video-Editing Tools," in this issue, evaluates its successor and the range of video-production products.)

Whatever products you use, you'll find the following step-by-step techniques helpful in producing top-quality video effectively.



JEFFREY PELO

Preview Your Source Material

• **Make a story line** Start by previewing your source material and roughing out a story line. It's an old and oft-repeated suggestion that you should plan your production, and for a good reason: every story needs a beginning, middle, and end. Make sure you've got an idea of what material you'll use for each of these elements.

• **Check your drive space** Also make sure you've got sufficient hard drive space for the material you'll be digitizing. Running a test early, to gauge the storage requirements that your video hardware and software will demand, can prevent a "disk full" alert while you're on deadline later.

• **Log segment positions** If you're using consumer video equipment to capture your source material, note the tape-counter positions for each segment so you can find them later. If you're using more than one source tape, number each one and log that number in your notes.

Capture Your Video

• **Capture more than you need** Start capturing the images before the beginning of each logged tape-counter position to ensure that you get all of your segment. You'll edit the

BY MATTHEW LEEDS

ues

start and end points later.

Expert technique With professional gear, you can take advantage of machine control and time coding to grab just the segments you want. But you may want to grab more at the beginning and end and edit it later, particularly if you plan to use split edits.

• **Check capture quality** Once you've digitized your clips, preview them. Check for dropouts, frame glitches, stutters, or other problems (see the screen image "Movie Analysis"). In Premiere, use the movie-analysis tool to check the average frame rate and to see if any frames have been dropped.

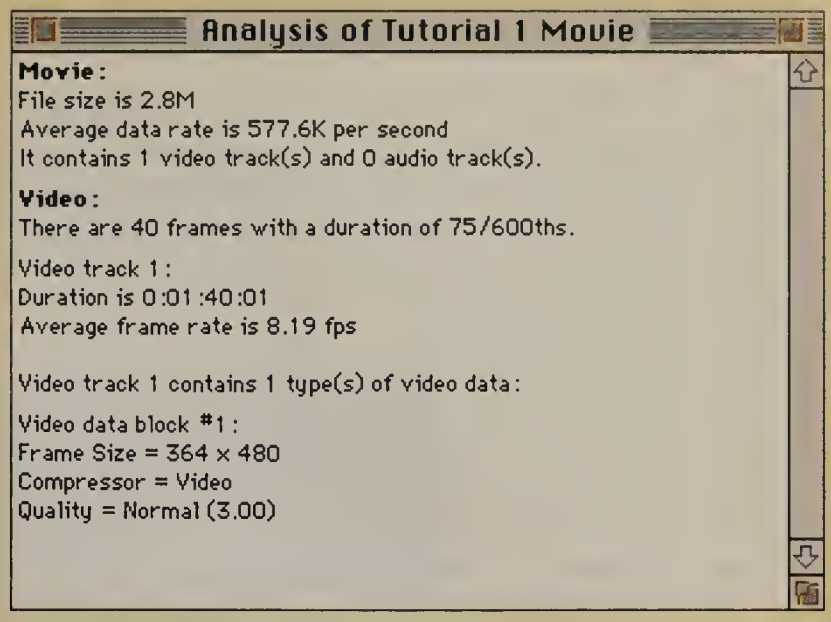
Expert technique You can cure dropouts by exporting the frame segments with dropouts as Filmstrips, retouching them in Adobe Photoshop, and then importing them back into Premiere. If a video-player head clog or massive dropout has trashed a frame, use Premiere's razor tool to cut that frame out and then export the frame just before the damaged frame as a PICT file. Then import the PICT image back in, set its frame rate to 1/30 second, and insert it where the damaged frame was, as the screen image "Fixing Dropouts" shows.

Piecing Together Clips

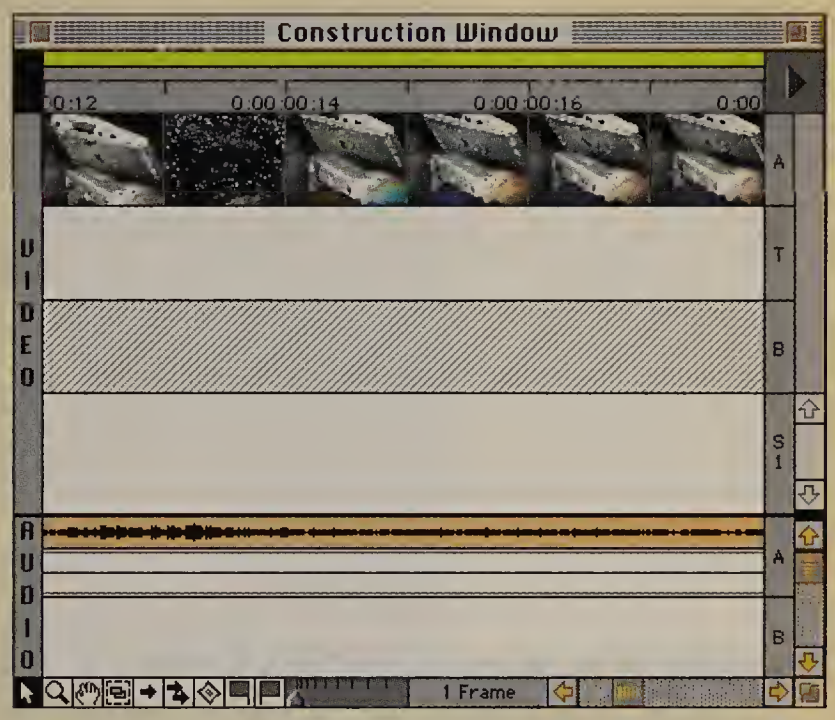
• **Plan for transitions** As you preview each clip, think about its starting and ending point. In Premiere, you can trim your in and out points accurately using either the scrub wheel in the Clip window or the left- and right-arrow keys on the keyboard (see the screen image "Clip Trims").

Also, think about how you're going to get from the end of one clip to the start of the next. What kind of transition will you use: straight cut (an abrupt change from one clip to the next), some kind of wipe or fade, or another technique? Watching television for the production techniques used can give you a good background. Notice how most of the transitions are straight cuts. Overusing wipes and fades is the desktop video equivalent of using 30 fonts in a newsletter.

Expert technique One reasonably subtle technique is the split edit. This is an edit where the audio and video don't make the transition at the same time. It's great for voice-overs, or for starting the dia-



Movie Analysis Premiere's movie-analysis feature provides valuable information. For example, here it shows that the movie would not play well from a CD even though it plays at just 8 frames per second, because its data rate exceeds the 300K-per-second limitation of a double-speed CD player.



Fixing Dropouts The second frame is glitched, most likely the result of a massive dropout on the videotape. Buy the best tape you can afford. Professional videotape offers fewer dropouts than consumer tape.



Clip Trims Use the scrub wheel to slowly step through your clips and find the exact edit point you want to use. The scrub wheel (the dial viewed edge-on) is on the left, just above the slider.

logue in a new scene as the camera pans the scene, or to cover some unusable video at the end of a clip (the audio continues, but the video is replaced with something else). To create a split edit in Premiere, use the Break Link command to separate the video and audio portion of a clip. You can then edit the video and audio separately.

Expert technique You can combine the split edit with a variant of the technique used to fix a damaged frame to add length to a video clip. Split a clip into video and audio, shorten the video to just the portion you want, and then export the last frame of the video as a PICT image. Now import that PICT image and add it to the end of the video segment (as a still frame), and set its duration to coincide with the ending of the audio. Use a transition to the next video segment that starts at the beginning of the still frame (such as a page turn or curtain), and you've got a great transition. The screen image "Advanced Transitions" shows how the tracks appear when this technique is used.

- **Create titles** You can use the Title window in Premiere to create titles for your movie (see the screen image "Creating Titles"). If you plan to export your movie to videotape, keep in mind that NTSC video has less resolution than your Mac's monitor and that many colors or color combinations don't hold up well once they have been moved to NTSC. Avoid gradient fills, saturated colors, and some types of drop shadows. Again, TV may provide good examples of titles that work.

Prepare for the Audience

- **Preview the final video** When your movie is finished, think about your viewing audience. If people will be viewing your creation on a Mac, consider whether the file will be played back from a hard drive, cartridge, or CD. The playback rates differ for each, and you should preview your movie on the slowest system it's likely to be seen on. Don't use a compression codec (the software coder/decoder used, for example, in QuickTime) that relies on hardware assistance unless you know that the same hardware will be available for playback.

Expert technique If you plan to use the CompactVideo codec (included with QuickTime 1.6), allow plenty of time for compressing in that format, since it takes much longer to compress than any other codec (although it does offer better playback rates). You might consider testing a portion of your movie compressed in that fashion first.

Producing great desktop video, just like desktop publishing, requires much more than merely developing technical expertise with hardware and software tools. Take the time to study the techniques used in TV and movies. You can use a tape deck with a good slow-motion and freeze-frame capability to analyze the methods practiced by the pros (a laser disc player is even better). You might also browse the magazine section at your local newsstand or public library for publications dedicated to cinematic technique. **m**

MATTHEW LEEDS is the technical-services manager for a major software developer and publisher.



Advanced Transitions The last frame on the Video A track (with the yellow dotted outline) is a still: a PICT file exported from the end of the clip and then imported back into the movie.



Creating Titles Premiere's title maker has all the basic features for creating titles. By using it with the special-effects filters, you can go far beyond this simple example.

RECOMMENDED QUICKTIME SETUP

It's hard to suggest a better video-editing setup than either the Quadra 660AV or 840AV. While neither offers 24-bit video capture, they both provide 16-bit audio capture, which is far more important in creating a perception of quality. Also, the new SCSI Manager provided with these machines improves their hard drive performance. Unless you're trying to do full-screen work (for which you also need a hardware compression board), you won't need a drive array.

On the video side, work with either Super VHS (SVHS) or Hi-8 tape formats. Both provide S-Video input and output (separate luminance and chroma) and much better resolution than standard VHS. For SVHS, Panasonic's AG-1970 videotape deck is deservedly popular ($1375 street price; Panasonic Communications & Systems, 201/348-7000, 800/742-8086), and the new Sony EV-C100 Hi-8 deck is an excellent recording and playback deck with a very affordable price (below $500 in stores; Sony Corporation of America, 201/368-9272, 800/222-7669). While it is not frame-accurate (so you can't accurately move to a specific frame for recording or playback), the EV-C100 does offer control-L machine control (a standard consumer-level control protocol), and third-party plug-ins let you control the EV-C100 from within Premiere.

There are
really only
two reasons
to buy
your next
workgroup
printer
from Apple.

It does more.

It's economical. *In keeping with the EPA's Energy Star program, the LaserWriter Select 360 seriously cuts energy waste. In its "sleep" mode, it automatically reduces energy consumption by as much as 78%.*

It's precise. *The new LaserWriter Select 360 can turn out graphics and text with 600-dots-per-inch clarity. So photographs are sharp, and even the smallest legal type is crisp and legible.*

It's award-winning. *The April 1994 Macworld just gave the LaserWriter Select 360 its highest rating. Cited as pros for the printer were its "excellent performance" and "low cost." Cited as cons: "None."*

MW ★★★★★
Macworld, *April 1994*

MacUser RATED 4½ APRIL 1994
MacUser, *April 1994*

It's fax-capable. *With the Adobe PostScript Fax option, any Mac® or PC user on the network can send a fax. It's as easy as printing. And because it's PostScript, the quality of the fax is distinctly improved, even when it's sent to a regular fax machine. You can receive faxes at the printer, too.*



The feature-packed LaserWriter Select™ 360.

It's compatible. *The LaserWriter Select 360 works in Macintosh or Windows environments — or both simultaneously. It switches automatically between PCL 5 and Adobe™ PostScript™ Level 2 jobs, so users never have to think about reconfiguring.*

It's flexible. *Two paper trays (250-sheet letter-size and 50-sheet multipurpose) make printing first-page letterheads simple. Plus, you've got options for 250- and 500-sheet trays, as well as a 30-envelope cassette.*

It's fast. *With a RISC processor at its heart, the LaserWriter Select 360 prints up to 10 pages per minute — faster than the Hewlett-Packard LaserJet 4M, whether you're printing simple Macintosh® text or complex gray-scale documents.**

**Based on an October 1993 independent benchmark study by MWA Consulting. †*Apple Price as of 1/15/94 does not include Adobe PostScript Fax option. Actual retail prices may vary depending on location.* *© 1994 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, Mac and Mac*

It costs less.

It's downright cheap. *Today the LaserWriter Select 360 is only $1,599.** With its high resolution, high performance and highly useful features, that works out to more printer for less money. It's that simple.*



The economical LaserWriter Select 360.

Apple®

registered trademarks, and LaserWriter Select is a trademark of Apple Computer, Inc. Adobe, PostScript and the PostScript logo are trademarks of Adobe Systems Incorporated and may be registered in certain jurisdictions. This ad was created entirely on Macintosh personal computers.

POWERBOOK POWER MANAGEMENT

LEARN HOW TO SQUEEZE EVERY MINUTE OF BATTERY LIFE FROM YOUR POWERBOOK

BY CARY LU

The overriding fear of most PowerBook users when they're on the road is that their battery will run out of power before they finish their work.

Advice on how to prolong PowerBook battery life abounds, much of it based on speculation rather than actual testing and measurements. To get definitive answers, Macworld Lab tested battery life under a variety of conditions to learn which steps really save power and which steps offer minor improvements or no improvement at all. Our tests simulate real-world use except in one area: we could not include sleep in the process, because our tests are automated through software for precise repeatability. (Once the PowerBook was in sleep mode, there would have been no way to wake it up.)

The results are in, and Macworld Lab found that only a few power-saving methods have a major effect on battery life. There are many steps that save a modest amount of power, but some may not be worth the compromise in your PowerBook's performance.

Our tests showed good consistency in results among batteries of the same type, but remember that battery mileage varies. In fact, batteries vary more than any other computer component. Every individual battery is a little different in its construction and its usage history. Unlike the CPU or RAM, batteries wear out through normal use. The way you use your PowerBook and the age of your battery also play a role in battery life.

Macworld Lab tests are based on the PowerBook 145B and 180c, but the suggestions and power-management principles apply to all PowerBooks and PowerBook Duos. In general, the Duos have a longer battery life than comparable 100-series PowerBooks. The Duos have a more efficient power-management system, lower-power internal circuitry, and a better battery technology—nickel-metal-hydride (NiMH)—than the current PowerBooks, which use NiCad batteries.

If you've decided to buy a PowerBook based solely on power consumption and battery life, you would be disappointed in the PowerBook's overall performance. Every desirable PowerBook feature—faster processor, active matrix screen, color—requires more power. So if you choose the PowerBook with the longest possible battery life, you'll also get the PowerBook with the slowest processor and simplest screen.

Power Theory 101

You don't need a degree in electrical engineering to prolong your PowerBook's battery life. However, you do need a basic understanding of how your notebook uses power. I describe how much power various steps save on PowerBooks in milliamps (ma). Amps measure the current or the flow rate of electricity; a milliamp is 1/1000 of an amp.

MW LAB

With all internal circuits except a modem running, here is the current consumption of three PowerBook models: PowerBook 145B, 1320ma; PowerBook 180, 1650ma; PowerBook 180c, 2370ma.

To make your battery last longer, you must reduce the amount of current the PowerBook draws. If you can reduce the current by 100ma, for example, you can add about nine minutes to the battery life of a PowerBook 145B, eight minutes to a 180, and five minutes to a 180c. The times vary among the PowerBooks because 100ma represents proportionately less current for a 180c than for a 180 or 145B.



Power-Saving Strategies

Power-saving steps are executed in several ways. You can invoke some automatically by setting time delays through system software. If you don't want to wait for the automatic steps to kick in, you can manually invoke a power-saving step. You can control other steps through software or hardware choices. For example, save power by turning off AppleTalk. All the software descriptions given here are based on System 7.1 with PowerBook Control Panel 7.2. (To see how different power-saving features affect battery life, see "How Long Do Batteries Last?")

Sleep The best thing you can do to save power (aside from shutting down your PowerBook) is to put the machine in sleep mode. During sleep a PowerBook draws almost no power—only 6–10ma. Even in sleep mode, its RAM remains alive, so you don't have to be concerned with losing the contents of your work.

- Choose Sleep from the Special menu in the Finder.
- Click on the sleep icon in the Battery control panel (if the icon isn't visible, click on the little flag at the right-hand end of the battery status bar).
- Use a PowerBook utility program. (For more on PowerBook utilities, see *PowerBook Notes*, *Macworld*, November 1993.)

I prefer a sleep F-key, which is quick and always available. However, this method requires practice: if you don't hit the sleep F-key just right, the computer records a double keystroke, immediately waking itself up again.

When you start using a PowerBook, before you put it to sleep you should save any new or changed data to the hard drive, just in case something goes awry later. But once you have established over time that your software is stable, you may want to save the power you would lose to disk access and save less frequently. (I save my RAM disk files to the hard disk only every two or three days.)

You might be thinking, Why not save power by just shutting down the PowerBook when you're not using it? Starting up a PowerBook cold typically takes about 30 seconds, depending on the start-up configuration, and you still have to open a document. Waking a PowerBook from sleep takes about 4 seconds from a RAM disk. Even waking up a PowerBook from the hard drive takes no more than 15 seconds. Unless you won't be using it for several days, or you need to connect a peripheral or change batteries, there's no reason to shut off your PowerBook.

An inactive PowerBook goes to sleep automatically after a duration that you can set in the PowerBook control panel. Apple uses two minutes of inactivity

MW LAB

How Long Do Batteries Last?

First we tested each PowerBook with settings that use the most power (Optimum Performance). Then we tested with settings that conserve the most power (Optimum Conservation). We added back each power-consuming feature to the Optimum Conservation setup, one at a time, to find out how each feature affected battery performance.

OBSERVATIONS

- Running the processor at a reduced speed added only a few minutes of battery life.
- Enabling processor cycling proved more effective than reducing processor speed.
- Dimming the screen saves a significant amount of battery life.
- The hard drive doesn't consume as much power as we expected.
- For short intervals between disk accesses, the benefit of spinning down a hard disk is offset by the need to spin it up again.
- The 180c did not dim the screen as much or as frequently as the 145B.

Longer bars are better.
Bars represent battery life in minutes.

	Brightness Level	Time till Hard Drive Powers Down	Time till Screen Dims	Processor Cycling	CPU Speed	PowerBook 180c	PowerBook 145B
Optimum Performance	**100%**	**8 min**	**5 min**	off	**normal**	72	151
Optimum Conservation	25%	.5 min	1 min	off	slower	97	230
with the CPU at full speed	25%	.5 min	1 min	off	**normal**	92	217
with Processor Cycling on	25%	.5 min	1 min	**on**	slower	89	200
with the hard drive always spinning	25%	**never**	1 min	off	slower	97	221
with the screen always on	25%	.5 min	**never**	off	slower	95	222
with an extremely dim screen	**0%**	.5 min	1 min	off	slower	110	262
with maximum screen brightness	**100%**	.5 min	1 min	off	slower	82	192
Run-Down Battery Test*							
Two-year-old 2.5-amp-hour battery	25%	.5 min	1 min	off	slower	66	157
New 2.9-amp-hour battery	25%	.5 min	1 min	off	slower	97	230
Third-Party Battery Options							
New battery	**100%**	**8 min**	**5 min**	off	**normal**	72	151
Technöggin PowerPlate 5x	**100%**	**8 min**	**5 min**	off	**normal**	239	509
VST Power Systems ThinPack	**100%**	**8 min**	**5 min**	off	**normal**	159	337

With all major power-saving steps invoked (except for sleep). Both batteries are Apple products. The 2.5-amp-hour battery is discontinued. The order and part numbers for the 2.9-amp-hour battery are M5545/C and M5654, respectively.

BEHIND OUR TESTS

To measure the real-world life of a battery, Macworld Lab wrote a set of QuicKeys macros to exercise different power-saving features of the PowerBook 180c and 145B. The macros launched applications such as Excel, Word, and FileMaker Pro and performed actual work within the applications. The macros simulated the way an actual user works: typing, pausing, and continuing to type. We didn't include any sleep time because the macros were unable to wake up the computer once it entered sleep mode. To measure the actual power consumption of major components—hard drive, CPU, display, and so on—within the PowerBooks, we used MacAdios, a portable data-acquisition device from GW Instruments, and programming laboratory-instrumentation-design software called SuperScope II (GW Instruments). Macworld Lab also built a special adapter to tap inside the PowerBooks to connect to the data-acquisition device. All data collected by SuperScope II was then used to analyze the battery consumption of each computer component. **—Macworld Lab testing supervised by Mark Hurlow**

before sleep as the default for battery operation. But if you are done with your work, you'll save battery life by putting the PowerBook to sleep right away.

Sleep is the most effective way to manage power, but a PowerBook will not go to sleep under any of the following conditions:

- You choose Stay Awake or Don't Rest in a control panel or from a PowerBook utility program.
- You have your PowerBook connected to a network.
- File sharing is on.
- AppleTalk is active on AC power.
- Apple Remote Access is running with the Answer Calls option on.
- An external monitor is connected.

Apple assumes that under these conditions you want to do something that requires at least intermittent CPU activity. Some utility programs can override Apple's settings that prohibit sleep under these conditions.

Screen The backlight takes more power than any other screen component. Even at minimum brightness, a PowerBook's backlight draws 200ma (monochrome) or 300ma (color); at maximum brightness, a backlight draws either 400ma (monochrome) or 900ma (color). Obviously, you should set the backlight brightness as low as possible and turn it off altogether when you have sufficient light. Under bright ambient light or in daylight, you can turn off the backlight altogether on a monochrome PowerBook. You can't do this with a color PowerBook because the screens are unreadable in bright light. The PowerBook control panel or a power-management utility can turn off the backlight automatically after a preset time—30 to 60 seconds works well.

Away from bright ambient light, you might want to shut off the backlighting at the same time system sleep kicks in. After all, if you can't see the screen, a wide-awake PowerBook doesn't do you much good. Setting the backlight to turn off before sleep mode kicks in does have one advantage, however: reactivating the backlight takes much less time than waking up the system.

Another part of power consumption applies only to active matrix displays, which have 256,000 transistors (monochrome) built into the screen, consuming a total of 105ma; or 921,600 transistors (color), which consume 380ma. These transistors, along with the screen driver circuits in all PowerBooks, can be turned off only with system sleep.

If your PowerBook has a color or gray-scale display, you will save only a minor amount of power by switching to black-and-white. The computer will run a little faster, however, and therefore save you a little time. Similarly, setting the desktop pattern to all white does not save measurable power, but a white or nearly white desktop might encourage you to keep the backlight turned down.

Processor cycling Macintosh users' fascination with CPU performance seems strange when you realize that most of the time a CPU has nothing to do: it's waiting for you to do something—type a character, save a file, sort a database, and so on. PowerBooks normally take advantage of this downtime by cycling the CPU rapidly between run and rest states. When nothing happens for about a second, the CPU goes into a rest state; after another half second, it wakes up and checks for activity. If there is no activity, it goes to rest again and repeats the cycle every half second or so until some activity occurs. Occasionally, a program that performs lengthy calculations without user input from the keyboard or trackball will slow down with processor cycling enabled. If you notice that calculations take longer than they should, you may want to switch off processor cycling.

The Processor Cycling control is in the PowerBook control panel in the Custom settings. Set Allow Processor Cycling in the control panel. (The Portable control panel in System 7.0.1 calls processor

FORGET ABOUT THE MEMORY EFFECT?



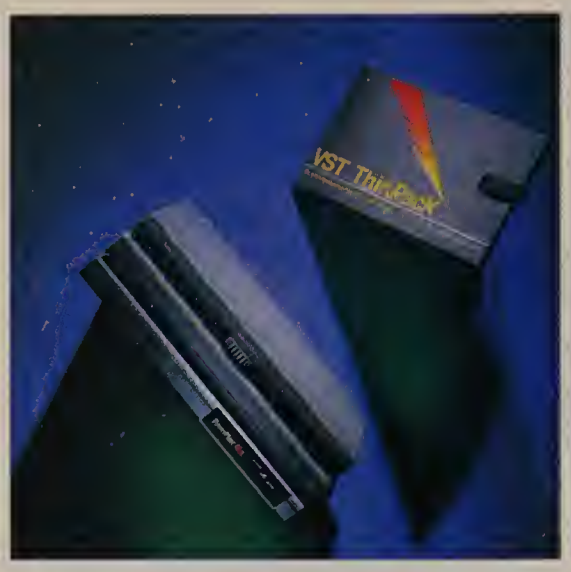
When NiCad batteries are partially discharged repeatedly, they suffer a voltage depression referred to as *memory effect*. The battery doesn't lose capacity; rather, the voltage output becomes depressed. Because the PowerBook always shuts down at the same voltage, the battery thinks it is capable of only that voltage, and the effect is shorter battery life. You can usually correct the problem with a deep discharge followed by a full charge. In problem cases, a battery may need two deep discharges.

You can perform a deep discharge by operating your PowerBook past all the low-power warnings until it shuts down by itself. For a little more discharge, leave the battery in the PowerBook and leave it turned on overnight before you connect the battery to a charger. Battery-conditioning accessories add another step—they automatically start the charging process after discharge; without a conditioner, you must connect a charger manually. A NiCad battery is good for about 500 recharge cycles, and a conditioner throws away a cycle each time you use it. So use a conditioner only when you can't restore battery capacity by ordinary charging.

The memory effect is real but not common. Sometimes the memory effect is confused with a worn-out battery. You would have to run through the same partial discharge many times for the memory effect to become a problem. (You would have to use the PowerBook for exactly 30 minutes, and then recharge it, for example, dozens of times before your battery would suffer from memory effect.) Macworld Lab tested for the memory effect with the common situation of five and ten partial discharges. First, we operated a PowerBook 180c with settings for optimum performance for 30 minutes and recharged it, repeating the sequence five times. After the fifth recharge, the battery ran for 65.3 minutes. Next we performed one deep discharge and recharge, after which the battery ran for slightly less time, 65 minutes. After a second deep discharge and recharge, the battery ran for 68.5 minutes. According to Macworld Lab tests, a 180c with a new battery ran for 72 minutes under the same settings.

For our second test, we started with a new battery. After ten 30-minute partial discharges followed by a recharge, this battery ran for 66.6 minutes. We then gave the battery one deep discharge and a recharge, and the battery ran for 68.8 minutes; after two deep discharges and a recharge, it lasted 70.1 minutes.

NiMH batteries suffer less than NiCads from memory problems, although Apple recommends a deep discharge once a month. The Duo 270c can perform a deep discharge and automatic recharge without any accessories, using Apple's Battery Recondition program. The lead-acid batteries of the PowerBook 100 and the third-party flat-pack batteries have no memory problem; fully discharging them causes permanent damage.



MARK JOHANN

External Batteries The only way to get substantially longer battery life is to get a bigger battery. VST Power Systems (508/287-4600) and Technöggin (513/321-1777, 800/305-7936) sell the most popular external batteries for the PowerBook 100 to 180. Two-pound external flat lead-acid batteries extend operation 3 to 7 hours. Four-pound double-battery versions run twice as long. Flat-pack batteries work well when you stay in one place (on a transcontinental plane flight, for example), but the extra size and weight make them awkward to lug around. Pictured above are the VST ThinPak ($199.95) and the Technöggin PowerPlate 5x ($299.95).

cycling System Rest.) If you can't see the control, hold down the option key when you flip the switch from Easy to Custom. Switching on processor cycling puts a 68030 CPU and its associated circuits to rest, saving 450ma of current on average, a major reduction. Processor cycling also turns off the floating-point unit (FPU), if present, for an 030 CPU, saving another 30ma. Some PowerBook utility programs can change the duration of delay before cycling; however, the PowerBook's default setting is optimal for most users, so you shouldn't make any changes unless you have a specific reason.

Hard drive In typical use, the hard drive consumes surprisingly little power, because it spends most of the time on standby. While spinning, the disk does draw significant power—typically 320ma, another 80ma during reading and writing, and an additional 40ma when the head is seeking. Typical head-seeks last for only a fraction of a second. Most applications don't demand sustained head-seeks, but some database managers do during sorting. When the hard drive is not in use (that is, when it stops spinning), it consumes only 40ma.

The PowerBook control panel puts the hard disk on standby automatically after one minute (the default setting). If you know you won't need your PowerBook for a while, you can spin down the hard disk immediately using an F-key. But once the hard disk has spun down, it takes time (5 to 8 seconds) and considerable power (1000ma) to spin the disk up again.

Modem A PowerBook turns on a modem only when a communications or fax program is running, so simply installing a modem does not add to the power load. Once it's on, however, a modem draws 110ma to 150ma. You should always remember to quit any communications or fax program when you're not using it. Sometimes a fax program puts something into the System Folder that leaves the modem turned on. Check carefully any software that uses the modem for automatic-answer features.

A modem's power consumption does not vary significantly with its operating speed; that is, a 2400-bps modem uses about the same amount of power as a 14.4-Kbps modem. Of course, faster speeds minimize the time that the modem must be on and save power indirectly.

AppleTalk If you are not connected to a network, turn off AppleTalk in the Chooser or via a utility program. The AppleTalk circuitry itself draws only 10ma. The power culprit is the CPU, which will not stay at rest with AppleTalk turned on; the CPU and associated circuits actually run a third of the time to monitor network activity. That 33 percent CPU duty cycle burns power, an average of 150ma. With AppleTalk turned off, a PowerBook also wakes up a couple seconds faster.

Limiting processor speed Another way to save power is to limit the speed of the processor. Note that this is different than processor cycling. PowerBooks (both 25MHz and 33MHz) can be reduced to a speed limit of 16MHz. Reducing the speed saves only 90ma to 120ma, however, and processor cycling must be turned on to achieve those savings. Performance suffers, although the degradation may not be intrusive with many applications. In Macworld Lab tests, a PowerBook 145B at 16MHz ran for 230 minutes, compared with 217 minutes at 25MHz. (All other power conservation options were also in place.) A 180c ran at 16MHz for 97 minutes, compared with 92 minutes at 33MHz. You may not find about 5 percent longer battery life worth the slower performance.

RAM disk In theory, a RAM disk saves some power by reducing or eliminating the need for a hard drive. In practice, however, it doesn't work that way. If your RAM disk contains only applications

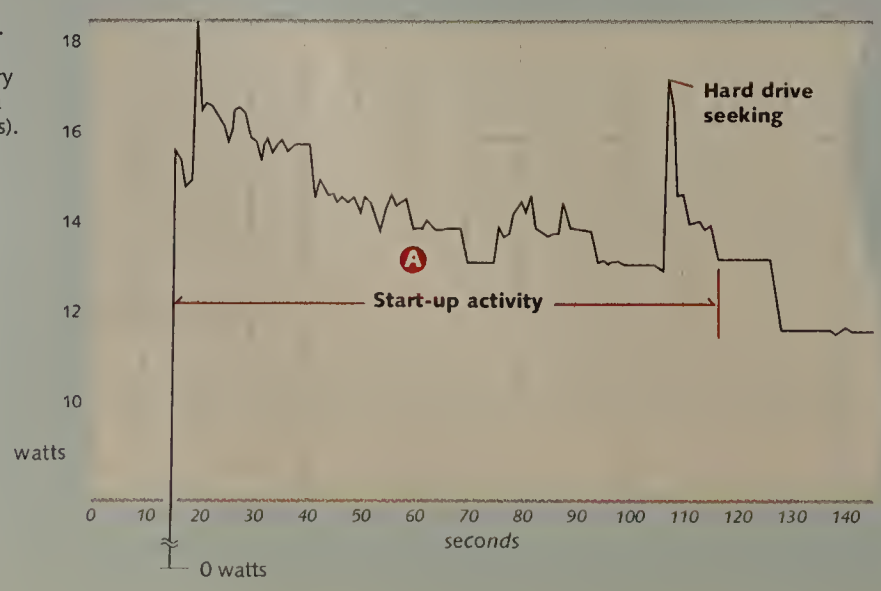
MW LAB

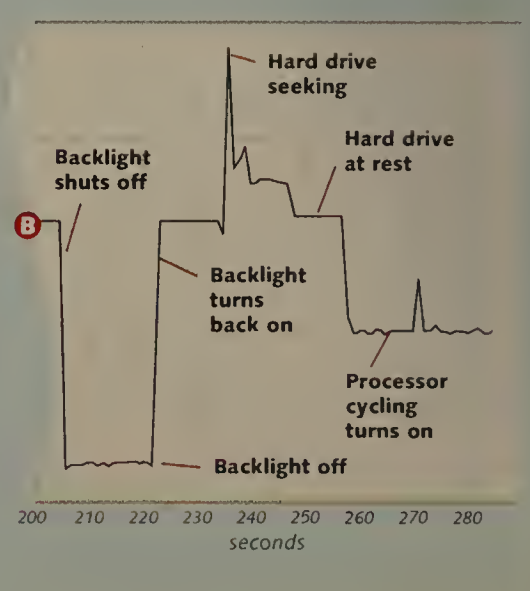
Measuring the Power Flow

To determine the amount of power consumed by the PowerBook 180c's CPU, hard drive, and screen backlight, we used GW Instruments' SuperScope II to measure changes in power consumption when various power-management features were implemented. As the measurements show, power consumption varies constantly; this is especially true immediately after a PowerBook is turned on.

A
- PowerBook is turned on.
- Hard drive spins up.
- System performs memory check and transfers data (for example, loads INITs).
- Screen and backlight activate and stabilize.

B
- CPU at regular speed.
- Processor cycling off.
- Hard drive asleep.
- Backlight on.





Power-Saving Techniques

Power-Saving Steps	When to Do It	How to Do It	Approximate Savings	Disadvantages
The big four				
Turn on processor cycling	always, unless you notice that calculations are slow	set Allow Processor Cycling in PowerBook control panel (automatic control only)	450ma (average); 480ma if FPU present	occasionally slows PowerBook performance
Reduce or shut down backlight	with sufficient ambient light	adjust backlight control next to screen; set Screen Dims in PowerBook control panel (automatic or manual)	200ma–600ma (dim); 400ma–900ma (off)	harder to see screen
Set hard disk to spin down	when hard disk not needed	set Hard Disk Spins Down in PowerBook control panel or a PowerBook utility program (automatic or manual)	150ma–250ma	hard disk needs 5–6 seconds and uses considerable power to restart
Set system to sleep	during periods of inactivity	set System Sleeps in PowerBook control panel, use a PowerBook utility program, or choose Sleep from Special menu in the Finder (automatic or manual)	1300ma–2200ma	can't use your PowerBook
Three secondary steps				
Turn off modem	when you are not using communications or fax software	quit communications program	110ma–150ma	can't communicate or send/receive faxes
Turn off AppleTalk	when you're not connected to an AppleTalk network or printer	set Inactive in Chooser or use a PowerBook utility program	150ma	can't access an AppleTalk network
Slow processor to 16MHz	when processing speed is unimportant	set Reduced processor speed in PowerBook control panel (to make setting visible, hold down option key while clicking on the Easy/Custom switch)	90ma–120ma	some applications may perform noticeably slower
Three minor steps				
Use black-and-white screen (don't use grays or color)	when grays or color are not essential to your work	set Black & White in Monitors control panel	minor; speeds video performance	less attractive screen; can't view color images
Save files infrequently	as infrequently as you feel comfortable	manual control or automatic saving utility	minor	risk losing data
Turn off sound	when sound is not necessary	set built-in volume to minimum in Sound control panel (menu bar will flash in lieu of alert)	minor	can't hear cool Mac sounds

and files, your hard drive still has to come on for system functions such as fonts and file management. You can create a self-sufficient RAM disk complete with a System Folder, but only the PowerBook 100 (discontinued in 1992) can handle a RAM disk gracefully. On the 100, the RAM disk remains alive even after you shut down the computer. On all other PowerBooks, you lose the RAM disk when you shut down the computer.

Three programs let you install a persistent RAM disk by automatically saving the entire RAM disk to the hard drive when you shut down your PowerBook and automatically re-creating the RAM disk during start-up: Maxima ($99, Connectix Corporation, 415/571-5100, 800/950-5880), RAMDiskSaver ($69.95, Atticus Software Corporation, 203/348-6100), and Apple File Assistant ($79, Apple Computer, 408/996-1010, 800/538-9696). But you can't put the hard drive in the Trash, which would let you start up directly from the RAM disk, so occasionally you have to wait for the hard disk to spin up even when you don't need it.

The bottom line on RAM disks is that they don't save much power in most situations, since a hard drive draws so little power when it's resting. The main advantages of a RAM disk are faster response during operation (especially if the RAM disk has a System Folder) and not having to wait for the hard drive to spin up.

Memory Adding RAM adds only a slight power burden. For example, adding 10MB to a PowerBook 180 (for a total of 14MB) adds just 10ma during operation, 2ma during sleep. RAM may not extract a heavy toll in terms of power, but you pay a heavy price for using virtual memory. Since virtual memory forces considerable disk activity, don't use it under battery power unless you desperately need it.

Choosing Batteries

Batteries are customarily rated by their energy capacity in amp-hours. Apple now ships 2.9-amp-hour batteries, the highest capacity available; the earlier 2.5- and 2.8-amp-hour batteries have been discontinued. If you buy a new battery, your first choice should be a 2.9-amp-hour unit. However, you might be able to find a 2.8-amp-hour battery for a more attractive price, in which case you must decide whether you are willing to live with slightly less battery capacity. Don't be fooled, though, by companies that claim their 2.8-amp-hour battery is "rated" for 3.0 or 3.1 amp-hours. This kind of wording is playing games with specifications. Several companies sell PowerBook batteries, but at this writing, all non-Apple batteries are limited to 2.8 amp-hours.

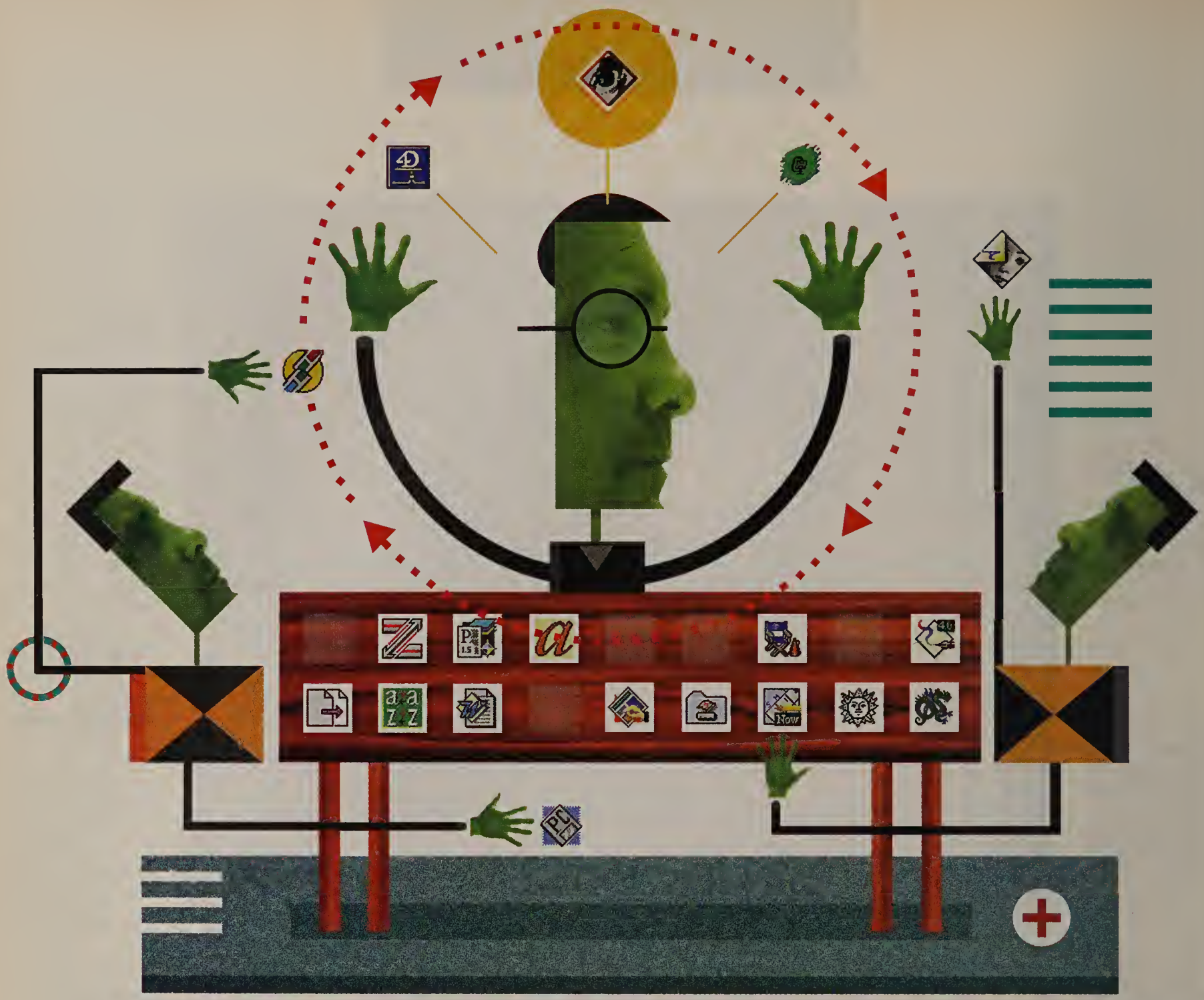
In addition to amp-hours, battery capacity depends on how much resting or sleep takes place, the temperature of the PowerBook's environment, and of course, the condition and age of the battery.

Prospects

Everyone wants a magic battery technology, something that can provide 15 to 20 hours of life on an internal battery. No such technology seems in the offing. A laptop designed from the ground up for battery operation could offer better battery life and desktop power, but no company has yet taken on such a challenge. While you wait for the ultimate laptop and battery, *Macworld*'s test results and power-management advice should help you wring every minute of battery life from your PowerBook. **m**

Contributing editor CARY LU writes *Macworld*'s *PowerBook Notes* column.

Macworld Lab would like to thank GW Instruments. Without its help and support, our tests would have taken a lot longer to complete.



Virtual Memory

USED PROPERLY, VIRTUAL MEMORY

No Mac owner wants to spend more money than necessary on new equipment. But to get your Mac to do what you need it to do, sometimes you have no choice. If you want to view full-color images or print high-resolution graphics, for example, there's no way around buying a 24-bit graphics card or a 600-dpi printer. However, if you find yourself occasionally short on RAM, you can get around buying more SIMMs. You can use your Mac's virtual memory capability. Many people don't use this option, because if used improperly it comes at a high price—slow performance, since a disk drive can take 1000 times longer than a SIMM takes to transfer data. However, Macworld Lab testing confirms that you can use virtual memory effectively if you follow some simple techniques.

If most of the programs you regularly use fit within your current RAM space, consider using virtual memory to occasionally run a program that demands more RAM than you have. Likewise, if you normally have only one program at a time open, but use multiple programs in the course of your day, virtual memory is

a viable way to keep several programs available without buying extra RAM. Owners of PowerBooks and some older Macs may also have RAM-expansion limits that encourage them to consider using virtual memory.

For many Mac users, buying more RAM is the best approach. If each of your standard applications demands 8MB of RAM and you have just 4MB, get the extra RAM, since you will see a noticeable slowdown from using virtual memory constantly. (And remember, all those INITs and system fonts take up a huge chunk of RAM.) You can also consider two new products that promise to increase the amount of RAM through software techniques; see the sidebar, "Real Alternatives to Virtual Memory."

If you decide to use virtual memory, you have two choices. One is Apple's virtual memory scheme, which is built into System 7 and works on all 68030-, 68040-, and PowerPC-based Macs (you turn on virtual memory via the Memory control panel). Connectix Corporation sells Virtual and Compact Virtual ($99 each, 415/324-0727, 800/950-5880), which work on 68030-based Macs running either System 6 or System 7. (Compact Virtual is designed for Mac Plus, SE, and Classic models enhanced with a 68030-based accelerator card.) Neither Apple's nor Connectix's solutions support 68000- or 68020-based Macs, which lack a component, the Paged Memory Management Unit (PMMU), that's required to handle virtual memory.

Realities

by
David Pogue
and Galen Gruman

CAN SAVE YOU FROM BUYING UNNEEDED RAM

MW LAB

The True Story

Many people have misperceptions about virtual memory that inhibit its effective use.

Slowdown Concerns The common belief is that virtual memory is worth using only as a last resort—in a memory pinch—because it slows down the Mac so much. The fact is, however, that virtual memory barely slows down work *within the program you're working in.* (Your system *will* slow down if you use virtual memory improperly—for example, if you switch frequently between multiple applications. In this scenario, virtual memory continually and frantically swaps information, setting aside what's currently in RAM and taking from the disk the information virtual memory needs next.)

To help manage the exchange of data between actual RAM and virtual memory, the Mac creates an invisible file, a *swap file*, on the hard drive. This reserved chunk of disk space acts as faux RAM.

The critical point: if you have enough RAM for a program to run without virtual memory, it won't run any slower with virtual memory enabled. For example, on a Mac with 5MB of RAM, Microsoft Word (which reserves 1200K of system memory) runs at the same speed whether or not you use virtual memory. And why wouldn't it? It fits completely into system RAM, with or without virtual memory.

There are only two times when virtual memory slows down the works. The first is when you try to run a program that doesn't normally fit in your Mac's RAM. If your Mac has 4MB of memory, and you run a program that requires 7MB, virtual memory lets you run it—but you notice a painful slowdown. At this point, the Mac must thrash data back and forth, as needed, between the disk and RAM while you are using the program.

The second slowdown occurs when you *change* from one program to another. Again, you pay the virtual memory penalty. Virtual memory must return the RAM-based information about the current program to the hard disk, then immediately read the disk to load the necessary information for the next program. Nonetheless, it's difficult to consider this a slowdown in performance, since even this process isn't nearly as time-consuming as quitting one program and then launching another.

There's one final exception to the no-slowdown rule: background programs. If the foreground application uses all the Mac's RAM, then a background program (such as a telecommunications program downloading a file, or PrintMonitor printing) will indeed slow down, as virtual memory shuffles program code between RAM and the disk. Therefore, to escape sluggish response, your Mac needs enough system RAM for both the active program and any busy background programs.

The secret to effective use of virtual memory is to keep the active programs and data in RAM all the time. To gauge the amount of system RAM needed to ensure that your active programs and data fit into it, follow these steps.

- Choose About This Macintosh from the Apple menu to see how much RAM the System uses. (You may want to get rid of any INITs and fonts you don't need at this point, to reduce memory usage.)
- For each program you use, call up Get Info from the File menu (or just press ⌘-I) to see how much memory is allocated to the program in the Preferred Size field. (You can actually change this value, as long as it does not fall below the Minimum Size setting. Most people adjust it upward to give the program more breathing room, particularly for programs—like QuarkXPress, Aldus PageMaker, and Adobe Photoshop—that support plug-in software modules.)
- Use Get Info to see the size of the biggest file (such as a spreadsheet, database, or word-processing document) that you expect to open routinely. As you're searching for your largest data file, don't include Photoshop and FileMaker files. These programs' data files can be huge—so huge that each program has its own type of virtual memory. (More later on how to deal with conflicting virtual memory techniques.)
- Add the amount of memory used by the System, the program with the largest Preferred Size value, and the largest file. That's how much system RAM you should have. If you use virtual memory in addition to that RAM, you'll see little or no slowdown in day-to-day work, and you'll retain the advantage of having virtual memory when you need it.

Virtual Memory Limits When you open your Memory control panel to turn on virtual memory, you have to decide how much total memory you want to wind up with. Apple and many Mac gurus

generally advise you not to get greedy. Set your total memory (RAM plus virtual memory), they say, to no more than twice the amount of real RAM in your machine. That may be a convenient rule of thumb, but it's not accurate. In truth, the amount of virtual memory you can comfortably use increases exponentially with the amount of real memory.

For example, if you have a Mac with 2MB of RAM, you can use Apple's virtual memory only if you make your *system heap*—the memory used up by System 7 and all of your control panels and extensions—as small as possible. That means doing without extensions, turning down your Adobe Type Manager and disk-cache settings, and (if practical) turning off AppleTalk and file sharing. If you go to all that trouble, you can barely get virtual memory onto its creaky feet, at a maximum setting of 3MB to 4MB (RAM plus virtual memory). Even the addition of 512K makes a huge difference in these low-memory configurations.

In general, according to the developer of Apple's virtual memory scheme, on a Mac with 4MB of RAM, a virtual memory setting of 8MB to 10MB is practical; on a Mac with 8MB, you can set virtual memory as high as 20MB; with 16MB of RAM, you can comfortably set virtual memory up to about 50MB. And if you have 32MB, you can set virtual memory as high as you want.

Power Mac Usage Apple recommends setting virtual memory to 1MB more than your physical memory, to free up memory used by the System for applications. Because so few PowerPC programs are shipping, we could not confirm how much of a benefit this technique actually provides. For 680X0 programs, we found that virtual memory on a Power Mac is no different than on a 680X0 Mac.

PowerBook Usage If you click the Virtual Memory On switch in the Memory control panel on a PowerBook, an alert message instantly appears, warning that the increased disk activity of virtual memory will run down your battery.

That's true, of course—*if* the PowerBook is running on battery power. If it's plugged into an AC adapter, however, virtual memory is ideal for these perennially low-memory notebooks. If you use Apple's built-in virtual memory, the annoyance of having to remember to switch off virtual memory before taking battery-powered road trips may be more hassle than it's worth, but Connectix Virtual can automatically shut itself off whenever the PowerBook is running on batteries.

Hard Drive Considerations Both Apple and Connectix agree that the effects of defragmentation have been overemphasized. Only if a hard drive is severely fragmented—say, it's been nearly full for weeks—is virtual memory speed affected. Of course, with a drive that badly fragmented, you would notice performance problems with or without virtual memory enabled.

It is true, however, that a faster hard drive can make a dramatic difference in virtual memory swapping speed; a modern, fast hard drive can make virtual memory perform 50 percent better than, say, an ancient Mac II's hard drive. In general, the higher the capacity of your hard drive, the faster the performance.

Whose Virtual Memory Is Better?

Surprisingly, when you turn on Apple's virtual memory, it doesn't just create a swap file the size of the extra memory you want. It creates a file as large as the *total* memory: RAM plus virtual memory.

This strategy enhances speed. Yes, a virtual memory scheme could juggle data

MW LAB

Is Virtual Memory Fast Enough?

Virtual memory performance depends greatly on how virtual memory is used. The more you use it, the more the hard drive's speed affects overall system performance. In the worst case, where all computations occur in virtual memory, your Mac's processing speed will be limited by the hard drive. In cases where virtual memory is used to give just a temporary memory-capacity boost or to store applications that are open but not currently in use, the drag on performance is much less. The results below show performance under low-memory conditions.

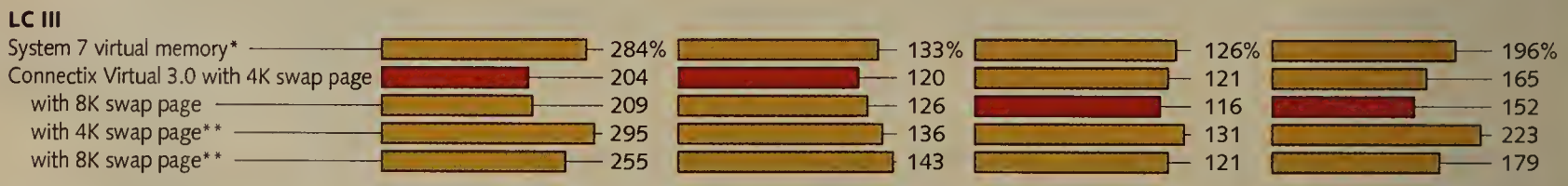
Best result in each test.
Bars show the percentage of time needed to complete a task compared with the time needed by a Mac using sufficient physical memory. (An LC III with 10MB of RAM and no virtual memory = 100 percent.) Shorter bars are better.

Switch Programs
This is the best way to use virtual memory. While the slowdown is the most dramatic, it occurs only when the Mac switches a program from virtual memory into physical memory.

Operations
The slowdown is more dramatic if a program frequently needs to use virtual memory (such as when recalculating a spreadsheet).

Open Documents
The slowdown is minimal if you use virtual memory as an occasional complement to physical memory (such as to open a document when all physical memory is taken).

Open Program
The slowdown is moderate when the Mac loads an application into virtual memory. However, it takes three times as long to load a program as it does to switch to a previously loaded one.



*Uses 4K swap page, which cannot be modified. **With DiskSaver option enabled.

BEHIND OUR TESTS

To test virtual memory performance, we compared a Color Classic and an LC III each with 4MB of RAM and virtual memory enabled, against a Color Classic with 12MB of RAM and an LC III with 10MB of RAM. We set the amount of virtual memory to give both Macs 12MB of total RAM. This let us gauge the effects of virtual memory on low-RAM systems, the kinds that should benefit most, against systems with an amount of RAM that should make virtual memory unnecessary in most cases. We show the results only for the LC III because the Color Classic performed similarly (it slowed down about 15 percent more in each test). We compared performance of System 7's built-in virtual memory with that of Connectix Virtual. We used a variety of documents (from Microsoft Excel 4.0, Microsoft Word 5.1, and Aldus FreeHand 3.0) as well as a variety of common operations (in Excel, Word, and Wolfram Research Mathemetica 2.2). Finally, we measured the time it took to switch between applications loaded into virtual memory. Because Connectix Virtual allows different memory-page-size and disk-usage options, we performed our tests with all possible combinations.—**Macworld Lab testing supervised by Mark Hurlow**

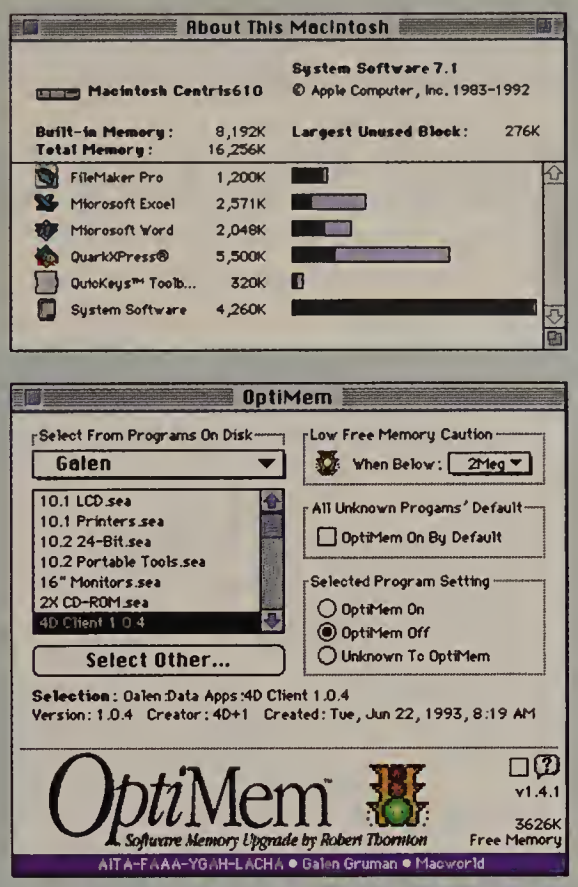
Macintosh users have had only two choices: buy more RAM or use virtual memory. Now there's a third option: memory-boosting software. Two products—OptiMem ($129, Jump Development Group, 412/681-2692) and RAM Doubler ($99, Connectix Corporation, 415/324-0727 or 800/950-5880)—change how the Mac deals with memory to make more of it free to applications. Note that while we were able to install the current version of OptiMem on a Power Mac, it did not function correctly (it falsely reported low-memory conditions), at least on an early Power Mac that Apple loaned us. RAM Doubler will not install on a Power Mac; a native version is expected later this year.

How They Work The Mac normally allocates a fixed chunk of memory for an application—you can see what those values are and even change them via the Preferred Size field in an application's Get Info dialog box. Once allocated, that memory is unavailable for other programs, even if the allocated memory is not being used. Both OptiMem and RAM Doubler reallocate application memory dynamically, based on what each program needs at the time. RAM Doubler goes a step further by compressing the contents of memory as you work.

This all sounds a bit scary, and I certainly felt uncomfortable trusting the Mac I use every day to them. But I did it, first for a week with OptiMem and then for a week with RAM Doubler. I tested them in a Centris 610 with 8MB of RAM running System 7.1, with all my usual INITs activated (which meant my System took about 3.5MB of the available 8MB).

OptiMem The latest version of OptiMem (1.5.4) fixed the erratic operation of previous versions (1.4.1 was reviewed in *Macworld*, March 1994), which often led to system lockups as the program tried to juggle memory for open applications as I repeatedly switched between them. (That's my normal working style, since I'm usually working on parts of a dozen projects in any one day.) If you come across programs that have problems with the latest version, you can set OptiMem so it will leave their memory settings alone.

If you use OptiMem, check with Jump periodically for updates, since it's likely that new and revised programs will introduce new memory-handling incompatibilities.



Thanks for the Memory RAM Doubler (top) gives a Mac almost twice the amount of RAM as is physically installed. The number of active programs shown here on a Mac with 8MB of RAM would not be possible without RAM Doubler. OptiMem (bottom) adds less usable RAM because it makes the Mac work with its physical amount of RAM (although more efficiently). It can also be turned off for any programs it has conflicts with.

RAM Doubler Operation with RAM Doubler was similar (see *Reviews, Macworld*, May 1994). For example, using it resulted in frequent system lockups when I loaded both Adobe Photoshop 2.5 and any other program in memory; the system did not lock up if I added more system RAM to the Mac beyond the original 8MB. Macworld Lab also found that RAM Doubler 1.0 can cause a system lockup when a Mac without RAM Doubler accesses a Mac with it over the network or via a remote-access dial-up link. (The problem does not occur when going from a Mac with RAM Doubler to a Mac sans RAM Doubler.) Version 1.0.1 fixes the problem.

RAM Doubler added about 20 percent to the time it took a Centris 610 to load programs due to the time RAM Doubler needs to compress the data into memory as programs load. The relatively slow speed of the 610's CPU (20MHz) and its lack of an FPU, which aids compression, account for that slowdown. On one of Macworld Lab's Quadra 650s (which uses a 33MHz 040 with FPU), the delay for compression was not noticeable. The slower your Macintosh, the more likely you are to come across this performance penalty (which OptiMem does not have).

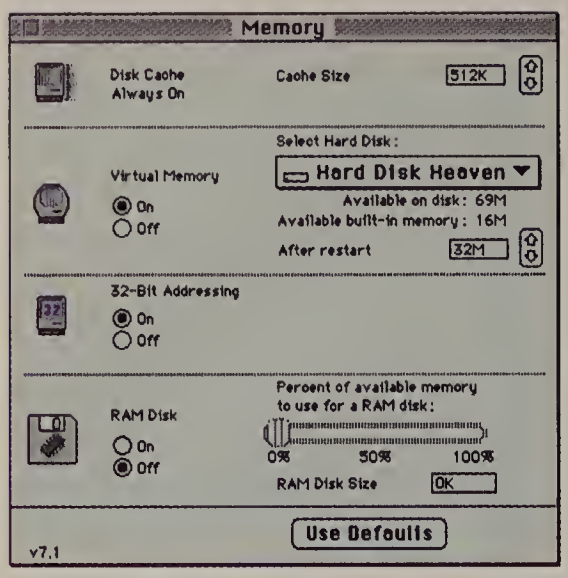
I don't trust on-the-fly disk compression, since it acts on permanent data, and I've been burned more than once when using it; but I'm less leery of memory compression, since the worst that can happen is your system will lock up and you'll have to restart (save often, as you should anyhow). And RAM Doubler rarely did lock up in my work.

Which to Choose? Because RAM Doubler really did double my available memory, I've left RAM Doubler installed. I've bumped my Centris 610's RAM up by 4MB to 12MB, so Photoshop now loads comfortably with other programs even with RAM Doubler active, but that's less RAM than I would have had to buy without RAM Doubler. OptiMem is an improvement over having nothing, but why settle for just more-efficient memory usage when you can get more memory?—**Galen Gruman**

using a swap file only as big as the additional memory you want. But the Mac would have to use this file the way it uses a hard drive, saving data to any space available. The next time your system needed that data from the swap file, it would have to search for it. However, a swap file that equals the total of actual memory and virtual memory is more efficient because your system can keep better track of data by mapping each piece to its own location in the swap file. Under Apple's Virtual Memory, the system always knows where the data is because it's always in the same location in the swap file. Apple decided to give you faster performance instead of disk space.

However, in making the same trade-off, Connectix's Virtual (3.0 is the latest version) is even faster—taking about three-quarters as long as Apple's virtual memory in situations when virtual memory affects the Mac's speed (such as opening a program), according to Macworld Lab tests. (See the benchmarks, "Is Virtual Memory Fast Enough?")

Virtual also has an impressive option called DiskSaver that uses less of your hard disk space for virtual memory. When DiskSaver is on, the invisible swap file isn't the size of the combined memory—it's only the size of the additional memory you want. You pay a price in speed because of the extra bookkeeping Virtual has to do. But even with DiskSaver turned on, Virtual is slightly faster on average than System 7's virtual memory scheme, according to Macworld Lab tests.



Memory Settings The Memory control panel lets you set the amount of virtual memory allocated through Apple's System 7. It's important to have 32-bit addressing active so the Mac can use any memory available over 8MB.

Virtual also beats System 7 because it gives the Mac more system RAM to play with. Apple's virtual memory scheme declares the entire System file off-limits to virtual memory swapping. On Macs with little memory to spare, such as a PowerBook with 4MB of RAM, that spoken-for 2MB of memory is a big loss.

The Virtual program, however, analyzes the system heap and declares only some of it important enough to keep in real memory (such as the all-important hard disk driver software). Virtual can identify nearly 1MB of material the Mac doesn't need at every moment—data that's safe to store in the swap file. So with Virtual, that hypothetical PowerBook has 3MB of real RAM, where it would have only 2MB using Apple's virtual memory feature. Remember, the greater the proportion of RAM to virtual memory, the faster the Mac's performance.

Finally, Virtual lets you change the *page size.* A page is the unit of memory that virtual memory swaps to the hard disk and back—under Apple's scheme, a page is a 4K unit. But data on hard drives larger than 256MB is stored in 8K or larger chunks called *blocks;* by letting you change the page size to 8K, for example, Virtual allows for faster data swapping on these larger disks.

When Not to Use Virtual Memory

All right, so virtual memory is wonderful, and Virtual is even more so. Why hasn't everyone stopped buying RAM chips and turned on virtual memory instead?

Frankly, more people should. But there are indeed times when virtual memory isn't an option. Running a program that's incompatible with 32-bit addressing (such as Microsoft Word 3.0) is one example. Most people turn on 32-bit addressing when using virtual memory because 32-bit addressing lets a Mac go beyond the 8MB limit imposed by 24-bit addressing used in older Macs. (Using virtual memory, you can go to 14MB with 24-bit addressing.)

There's another category of software that doesn't work well with virtual memory: programs that work with 32-bit color images. Because color images take up such a huge amount of RAM—more than is installed on most Macs—programs like Photoshop and Fractal Design Painter use proprietary virtual memory schemes.

For example, of the 4MB of memory required to run Photoshop, only a fraction is used for the program itself; the rest is reserved for storing the portion of your artwork that's visible in the editing window. The remainder of the artwork is stored in a swap file (which Adobe calls a *scratch disk).* This scheme lets you open a 100MB, full-color scanned image, for example, on a Mac with only 8MB of RAM. Each time you scroll the painting, Photoshop reads from the file on disk to throw the new part of the image onto the screen.

But suppose you're using a general-purpose virtual memory program (like System 7's virtual memory, or Virtual). You scroll. Photoshop grabs the information off the disk and feeds it into RAM, just as it always does. But in this case, you don't have real RAM; you have virtual memory, which means the information gets written *back* to the hard disk. In other words, using virtual memory with Photoshop is superimposing two virtual memory schemes. You wind up accessing the hard disk twice as much, and Photoshop's performance grinds nearly to a halt.

Of course, you could avoid this situation simply by turning off your general virtual memory whenever you use Photoshop or similar programs. But here's a more efficient trick: use the Get Info command on Photoshop's icon, and change the memory size to just under the amount of actual RAM in your Mac. When you launch Photoshop, it will load completely into real RAM; and the virtual memory feature will never kick in, since Photoshop will appear to be comfortable in its allotted true RAM. Photoshop will use its own scratch-disk virtual memory scheme—and you can still enjoy the benefits of general virtual memory for the other programs you may be running.

Other disk-intensive programs that may be too slow with virtual memory—even with the Get Info trick—are QuickTime playback programs. These programs have high data throughput, in which the data loaded into memory is constantly changing. Because virtual memory uses the hard disk, it is too slow to keep up with that fast stream of high-volume data.

Almost all popular business programs, however, are a match made in heaven with virtual memory.

Virtually Indispensable

The lesson in using RAM optimization of any sort is that you need enough physical RAM to handle your everyday needs—don't count on a Mac with 4MB and virtual memory doing work designed for a Mac with 8MB of real RAM. But you should take advantage of the extra memory you can get from virtual memory or memory-boosting software to handle the occasional need for more RAM (see "Real Alternatives to Virtual Memory").

The main benefit of virtual memory is to save you the time and hassle of quitting and relaunching programs. Therefore, force yourself to unlearn the habit of quitting when you're done with a task. Launch your programs into your new, yawning memory allotment, and leave them running all day.

Then count up all the real dollars you've saved on memory SIMMs, put your feet up on the desk, and treat yourself to a virtual Acapulco vacation. **m**

Contributing editor DAVID POGUE is the author of *Macworld's Desktop Critic* column.
GALEN GRUMAN is a *Macworld* senior associate features editor.

MEMORY-ENHANCEMENT SOFTWARE

MW EDITORS' CHOICE

Fast access, no major compatibility problems, and automated operation—those are the factors we used to judge which memory-enhancement products are best. While more RAM is always good, it's even better to enhance your RAM, even if you still decide to buy more SIMMs.

Virtual Memory Software

Virtual 3.0 Its faster speed and more-versatile configuration options make this program the best deal, even compared with the virtual memory Apple offers for free as part of System 7. **Company:** Connectix Corporation. **List price:** $99.

Memory-Boosting Software

RAM Doubler 1.0.1 On-the-fly compression of RAM may sound dubious, but it actually works very well and reliably, with little slowdown on many Macs. **Company:** Connectix Corporation. **List price:** $99.

We've built our reputation on professional publishers from around the world.

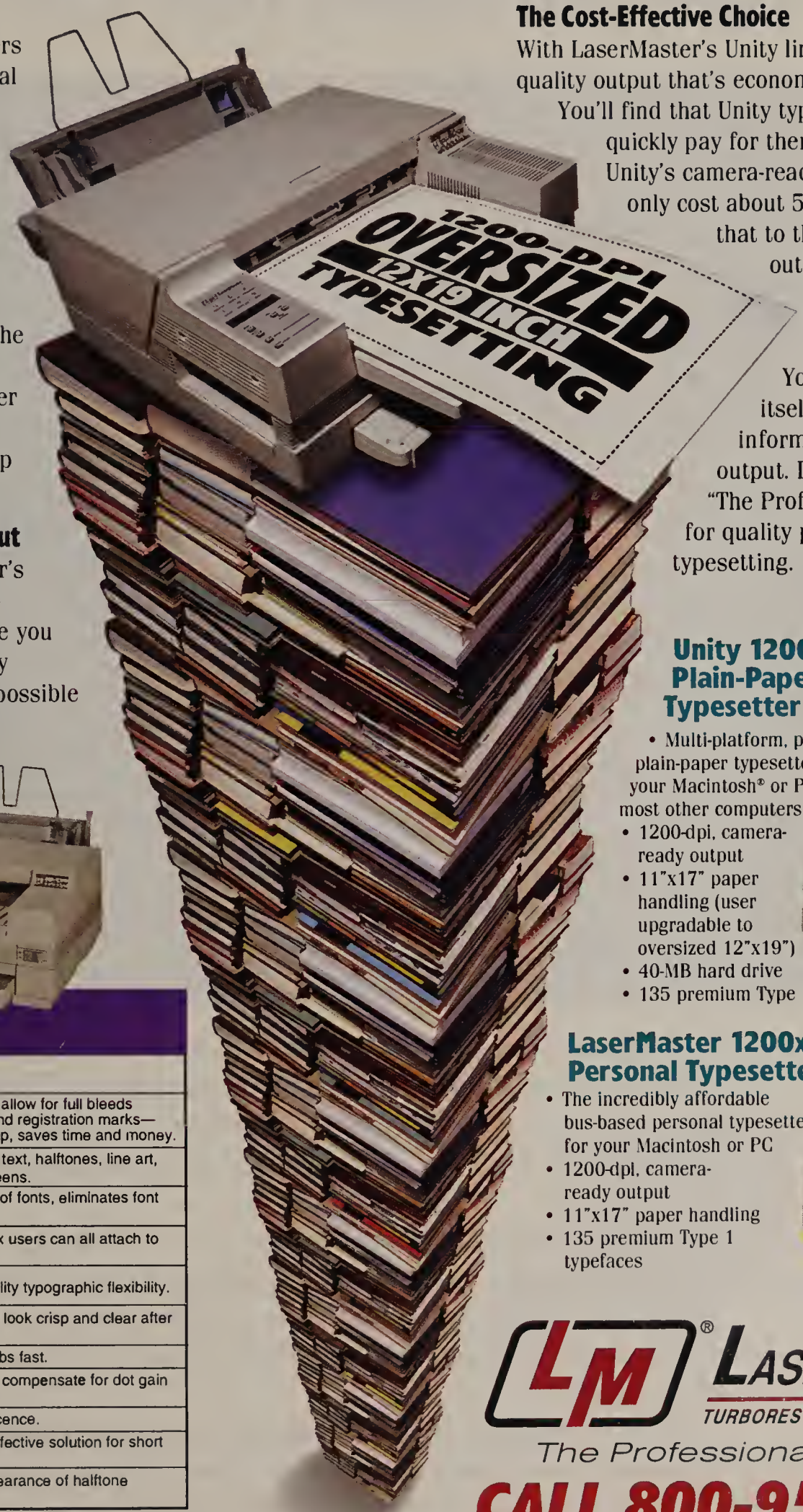
hen it comes to plain-paper
pesetting, LaserMaster's® users
ally pile up! Every professional
ows the physical appearance
their work is a direct
flection of their personal
rformance. That's why
ofessionals who want to look
eir best choose LaserMaster.

versized Typesetting

ıe Unity™ 1200XL-o offers all the
atures you'll need to get the
b done right. Its 12"x19" paper
ıpport lets you print 11"x17"
ocuments with full bleeds, crop
arks, and registration marks.

200-dpi Camera-Ready Output

ıity products use LaserMaster's
ıtented TurboRes® resolution-
ıhancement technology to give you
ecise, 1200-dpi, camera-ready
ıtput—the highest resolution possible
ı plain paper.



The Cost-Effective Choice

With LaserMaster's Unity line, you get quality output that's economical too. You'll find that Unity typesetters quickly pay for themselves. Unity's camera-ready pages only cost about 5 cents each. Compare that to the cost of imagesetter output that can cost as much as $9 a page.

TURBORES® FAST • LOW COST RECYCLABLE TYPESETTING

For More Information

Your work speaks for itself. Call now for more information and some actual output. LaserMaster is "The Professional's Choice™" for quality plain-paper typesetting.



Unity 1200XL-T Plain-Paper Typesetter

$6,995

- Multi-platform, plug-and-play plain-paper typesetter for your Macintosh® or PC and most other computers
- 1200-dpi, camera-ready output
- 11"x17" paper handling (user upgradable to oversized 12"x19")
- 40-MB hard drive
- 135 premium Type 1 typefaces pre-installed



OVERSIZED 12"x19"



Unity 1200XL-o Plain-Paper Typesetter

Features:	Benefits:
Oversized Typesetting	12x19-inch pages allow for full bleeds with crop marks and registration marks—eliminates pasle-up, saves time and money.
1200-dpi Resolution	For camera-ready text, halftones, line art, reverses, and screens.
Internal Hard Drive	Stores thousands of fonts, eliminates font downloading.
Multi-Platform Networking	Mac, PC, and Unix users can all attach to the same printer.
135 Premium Type 1 Typefaces Pre-Installed	Provides high-quality typographic flexibility.
ClearCopy™ Copier Enhancement	Ensures halftones look crisp and clear after photocopying.
33-MHz Processor	Processes print jobs fast.
Gamma Correction	Adjusts images to compensate for dot gain on press.
Software Upgradable	Prevents obsolescence.
Direct-to-Plate Option	Provides a cosl-effective solution for short print runs.
TurboGray™ Technology	Improves the appearance of halftone images.

LaserMaster 1200XL Personal Typesetter

$4,995
Includes Rebate

- The incredibly affordable bus-based personal typesetter for your Macintosh or PC
- 1200-dpi, camera-ready output
- 11"x17" paper handling
- 135 premium Type 1 typefaces



LM® LASERMASTER®
TURBORES TYPESETTING DIVISION

The Professional's Choice™

CALL 800-950-6868

or 612-944-9330 Fax: 612-944-0522

DEPT. 73L

1994 LaserMaster Corporation, 6900 Shady Oak Road, Eden Prairie, MN 55344. LaserMaster, e LM logo, and TurboRes are registered trademarks; "The Professional's Choice," TurboGray, ClearCopy, nd Unity are trademarks of LaserMaster. All other product or brand names are marks of their respective holders. hese products incorporate TrueImage v.1 software with LaserMaster enhancements for performance and resolution. pecifications subject to change without notice. Prices in U.S. dollars and subject to change without notice. This ad as produced using a Unity 1200XL-o.

Circle 43 on reader service card

"When People See What We've Done On The Desktop With VideoVision Studio, They Can't Believe Their Eyes."



Flavio Kampah heads KampahVisions, a broadcast design studio, directing and producing trend-setting, award-winning music videos and television graphics, including the U2 music video, Even Better Than The Real Thing. Flavio became a VideoVision Studio™ devotee while creating a new opening for the American Gladiator TV program and a series of promo spots for ESPN2 and Avirex Jeans.

"Until VideoVision Studio, it wasn't quite there yet. The motion, in particular, wasn't right. But with VideoVision Studio, we can use the Mac to produce work for broadcast television."

VideoVision Studio gives full-screen, full-motion video directly from a Macintosh®. It's a complete, no-compromise, professional quality, 24-bit, QuickTime-based video production system under $4,500.

"After working for years with traditional high-end computer graphics equipment, I'm convinced the Macintosh and technologies like Radius' VideoVision Studio are the most exciting designer tools in broadcast today. It puts control of the creative content back in the hands of the creator."

© 1994 Radius Inc. Radius, the Radius logo, "How The Best Get Better" and all Radius product and service names are trademarks of Radius Inc. All other names are trademarks of their respective holders. 3/21/94

VIDEOVISION STUDIO

radius™

HOW
THE
BEST
GET
BETTER.™



VideoVision Studio lets you input, capture, display, edit, add special effects, mix sound and output full-screen video at 30 frames and 60 fields per second. It comes with the hottest video editing and effects software, Adobe Premiere™ and VideoFusion.™ And VideoVision Studio is backed by our Lifetime Worry-Free™ Warranty and onsite, overnight replacement guarantee.



No other desktop system offers you such an incredible array of capabilities, so incredibly priced.

"The way the system works it's very easy for anybody to create high quality videos without the cost of a high-end editing suite."

Call 1-800-227-2795 Ext. 88C for more information about no-compromise desktop video production and the name of your nearest Radius reseller. For faxed information, call 1-800-966-7360.

Circle 146 on reader service card

EDITED BY JAMES A. MARTIN

Graphics

THE LATEST IN DESIGN, PUBLISHING, AND PREPRESS

Light Source Promises Consistent Color

LIGHT SOURCE HAS ANNOUNCED Colortron, a hardware-software system that the company says combines many of the color-accuracy and -correction capabilities of calibration devices, light meters, densitometers, colorimeters, and stand-alone spectrophotometers.

With an anticipated retail price under $1000, Colortron will enable photographers, desktop publishers, graphic artists, and other color-production specialists to easily capture the most accurate color data and maintain it throughout the production process, according to Light Source.

For example, Colortron could help recalibrate or correct the flesh tones in a scanned Adobe Photoshop image. You place and click the hand-held, battery-operated spectrophotometer on the original photograph or transparency, and the device measures the spectral data of the problem area and sends the color data to the Mac's Extended Color Picker (the spectrophotometer must be connected to the Mac's serial port). You could then apply that data to the flesh tones in the digitized image, so that the scan's flesh tones match those of the original.

Added to the image's EPS file, the spectral data provides a single, device-independent color reference for monitors, dye-sublimation printers, imagesetters, offset printers, and other devices.

With Colortron, a designer, for example, could ensure that the colors on a restaurant's menu and table linen match in all lighting conditions. Although colors may appear matched under one viewing condition, they may have different spectral curves. As a result, those colors may not match when viewed at sunset by candlelight. By measuring the spectral data of the tablecloth, the menu paper, and the restaurant's ambient light, Colortron would allow the designer to specify an ink color that closely matches the spectral curve of the dyed cloth.



ROBERT PERRY

According to Light Source, no other product on the market offers all of these abilities. Densitometers, for instance, cost at least $1500, take three measurements of a color, and translate the measurements into an approximate color space. Colortron takes 32 measurements across the full visible color spectrum and always maintains the same precise color data as a reference. Colortron is the only single device that measures reflective, transmissive, and ambient light, the company says.

Colortron should be available in June; planned accessories include a monitor-calibration cup and a spherical light-diffuser. Final pricing wasn't available at press time. Light Source, 415/925-4200.—JIM FEELEY

Adobe Updates Illustrator for Power Mac

THE LATEST VERSION OF ADOBE Illustrator will ship with versions of the draw program for Power Macs as well as 680X0-based Macs. Illustrator 5.5 includes several new features as well—among them the ability to perform some color trapping and to open and edit files saved in Adobe's Acrobat format.

Through version 5.5's enhanced pathfinder capabilities, you can perform trapping on color objects but not on color

gradients or placed color-graphics files. Illustrator also now offers the ability to import, edit, and export files in a wide variety of formats (including TIFF, Microsoft Excel, and Microsoft Word) via support for Acrobat's PDS file format. Any file saved in PDS format can be opened and edited in Illustrator 5.5. The new Illustrator also includes improved text-formatting support, such as tabs; text blocks with multiple rows and columns; and a spelling checker.

Version 5.5 ($595) is scheduled to ship in May. Owners of 5.0 can upgrade for $99; for 3.0 users, the cost is $149. Both Power Mac and 680X0 versions of Illustrator are included on seven high-density floppy disks. Adobe is also shipping Acrobat Exchange and Acrobat Distiller with the upgrade, at no additional charge. In addition, Illustrator 5.5 will ship with a CD-ROM that includes online documentation, augmented with QuickTime videos, and 180 Adobe Type 1 PostScript fonts. Adobe Systems, 415/961-4400, 800/833-6687.—J.A.M.

PaintBoard Turns Pro

RASTEROPS HAS ANNOUNCED THE PaintBoard Professional, a 24-bit graphics acceleration card that performs average QuickDraw operations up to four times as fast as the Quadra 950's standard internal video. Supporting large-screen displays up to 21 inches, the PaintBoard Professional features an extended desktop of 4000 by 3000 pixels for viewing oversize images. It also includes a 9-bit DAC (digital-to-analog converter) for improved color fidelity.

The PaintBoard Professional can accommodate an optional daughtercard, the RasterOps DSPro. The DSPro includes twin 66MHz DSP3210 chips to boost performance of Photoshop filters. The PaintBoard lists for $2199; together with the DSPro, it's $2999; the DSPro is $1099. RasterOps, 408/562-4200, 800/729-2656.—CATHY ABES

Tiling Patterns Emerge from Xaos

TERRAZZO, A $149 ADOBE PHOTOshop plug-in filter from Xaos Tools, lets you create repeating patterns from any PICT or native Photoshop formatted image in RGB, CMYK, and grayscale modes.

Using any of 17 geometric shapes to tile the pattern it creates, Terrazzo simulates a kaleidoscope. Moving the shape around an image produces dramatically different patterns. Controls include opacity, lightness, darkness, and hue/saturation/brightness. A Continuous Preview feature lets you see the effects as you create them. Blend Radius lets you blur tile edges to minimize the tiling effect. Terrazzo is due by the end of April.

Xaos has also released Fresco, a $199 CD-ROM of 80 royalty-free textures and backgrounds created by artist George Lawson, as well as an optimized version of Paint Alchemy (1.0.2f) that uses the Mac's FPU to boost performance by up to 100 percent. Xaos Tools, 415/487-7000.—CATHY ABES





DIANE FENSTER

Beyond 24-Bit Scanning

TWO SCANNER MANUFACTURERS recently announced color flatbed scanner models (under $3500) capable of capturing images with pixel density beyond 24 bits.

With an optical resolution of 600 by 1200 dpi (2400 by 2400 interpolated), Microtek's single-pass ScanMaker III ($3499) captures color images at up to 36 bits and automatically samples them down to true 24-bit images.

Also new is the ScanMaker IIHR ($1699), a three-pass 24-bit scanner with 600-by-1200-dpi optical resolution (2400 by 2400 interpolated). Both scanners come bundled with Adobe Photoshop and include Microtek's Dynamic Color Rendition (DCR) color-calibration and -correction technology. Both scanners are due to ship in March.

Meanwhile, Umax Technologies has announced PowerLook ($3495), a 30-bit color flatbed scanner (10 bits per RGB channel) that supports scanning of transparencies.

The one-pass PowerLook offers an optical resolution of 1200 by 600 dpi, which can be interpolated to 1200 by 1200 dpi (in hardware) or 2400 by 2400 dpi (in software). It has a SCSI-2 interface and a 2MB input/output buffer for fast scanning. Photoshop 2.5.1 is bundled.

Potential buyers of scanners offering more than 24-bit capture should keep in mind that, aside from Photoshop 2.5.1, few programs available today support more than 24-bit color. Microtek, 408/297-5000, 800/654-4160, Umax, 510/651-8883, 800/562-0311.—J.A.M.

IN BRIEF

■ **Legal Update** It is believed to be the first image-sampling lawsuit: on February 16, FPG International, a stock-photography service, filed a $1.4 million copyright infringement complaint against *New York Newsday*. The suit claims *Newsday* scanned photos from an FPG catalog and used parts of the photos in a published illustration, without permission.

■ **Two Printers in One** Seiko Instruments' Professional ColorPoint 2 PSF combines thermal-wax transfer and dye-sublimation technologies. The 300-dpi PostScript Level 2 printer includes a 160MB hard drive, handles full-bleed tabloid pages, and supports three color-management systems: EfiColor, ColorSync, and ColorSense. Due in mid-April, the printer costs $16,499; $17,199 with EtherTalk or TCP/IP; and $17,499 with both protocols. 408/922-5900, 800/888-0817.

■ **Imagesetter Print Preview** Working Software's CheckPost ($249.95) imitates imagesetter output on a laser printer to ensure there are no printing problems before sending the file to the imagesetter. 408/423-5696, 800/229-9675.

MAKE YOUR CHOICE THE EDITORS' CHOICE

It's not surprising that the editors of Macworld, MacUser and MacWeek praise Mirror products, since we design and build them to please the toughest customer of all: you! Whether we are selecting a power cord or designing a new graphics processor chip, we sweat all the details, so you get consistently excellent products for a great price.

MW ★★★★

Macworld, December 1993
Nikon CoolScan

From our fast, dependable hard drives and our razor-sharp monochrome displays to our highly acclaimed color scanners and the amazing Tornado graphics systems, every Mirror product is designed to give you the most for your money. No other company offers you the selection, performance and value of Mirror Technologies.

MacUser 1993 Choice · Winner · MacUser Editors

MacUser 1993
Nikon CoolScan



Scanning The Possibilities

Whether you are scanning black & white photos to include in a simple newsletter, or are scanning 35 mm color slides for inclusion in a national magazine, Mirror offers a scanner that can get the job done.

MacUser Rated 4½

MacUser
November 1993
Nikon CoolScan

Coolscan Slide Scanner

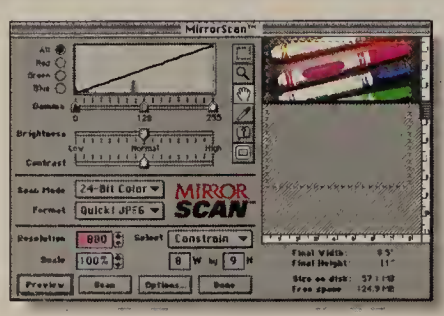
For professional quality scanning of 35 mm slides (or negatives), nothing comes close to the performance and value of the Mirror Coolscan System. This remarkable slide scanner features 2700 dpi resolution, for brilliant reproduction of even difficult images. The Eddy Award-winning Coolscan is the first scanner to bring true, reproduction quality color scans to the desktop for under $2000!

Mirror Color Scanners	
600 dpi w/Photoshop LE and Read-It!	$ 749
600 dpi w/Photoshop 2.5.1 and Read-It!	$ 899
800 dpi w/Photoshop 2.5.1 and Read-It!	$1099
1200 dpi w/Photoshop 2.5.1 and Read-It!	$1599
Transparency Adapter for 600/800 models	$ 599
Transparency Adapter for 1200 model	$ 699
Mirror CoolScan Slide Scanner	$1999



Award-winning Scanners

The Mirror Color Scanners are 24-bit flatbed scanners available in 600, 800 and 1200 dpi models. Scan reflective originals up to 8.5x11. With the optional Transparency Adapter, you can scan slides and other film too. Our exclusive MirrorScan software makes scanning a snap, with powerful features like color preview, JPEG compression, interactive gamma controls, and more. We even include Photoshop for the ultimate in image control.



Exclusive MirrorScan software

MacUser Rated 4

MacUser UK
October 1993
Mirror 800 Color Scanner

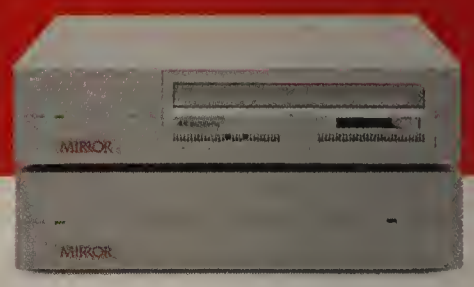
MacHome Journal, November 1993
Mirror 600 Color Scanner

MACWORLD MW EDITORS' CHOICE

Macworld
November 1993
Mirror 800 Color Scanner



Call 1-800-643-4142 for your free catalog



Driving A Hard Bargain

As one of the oldest suppliers of Macintosh storage systems, Mirror offers hard drives and SyQuest removable drives that you can count on. We know how valuable your data is, so we use only the finest drive mechanisms and associated components. Every drive is thoroughly tested before it leaves our factory, so you can rest easy.

Hard Drives	Internal	External
SyQuest 88c	n/a	$459
170MB	$229	$289
270MB	$299	$359
540MB	$565	$625
1080MB	$929	$989
1800MB	$1,239	$1,299
1900MB-Barracuda	$1,599	$1,659
2400MB	$1,749	$1,809
2400MB-Barracuda	$1,954	$1,999

Displays Of Brilliance

The newest additions to our award-winning monitor line-up, the Mirror Color Portrait Display and the Mirror 21-inch Color Display, embody everything that the critics love about Mirror products: high quality, unbeatable features, and a great price.

MACWORLD MW EDITORS' CHOICE
Macworld
July 1993
Full-page Display

Portrait displays have long been a favorite of desktop publishers and writers, but until now, you were limited to monochrome. The new Mirror Color Portrait Display is the result of countless requests for an affordable color monitor that could display an entire page. It works with the built-in video of newer Macs, as well as many standard video boards (including the Mirror Tornado board, of course.)

Colorful Value

The Mirror Display line also includes our best-selling 14, 16, & 20-inch Color models, and our standard-setting 15 & 19-inch monochrome displays. Models are available for most Macs.

MacUser RATED
MacUser
February 1994
16-Inch Trinitron

Big Color Performance

If you use a Macintosh for design, illustration or image-processing, the new Mirror 21-inch Color display is for you. It's brilliant color, superb sharpness and 1152 x 870 resolution will satisfy the most demanding user; and it's low price make it irresistible. This display actually puts itself into low-power "sleep" mode when there is no user present!



ProView Color Displays		w/Tornado
21-inch	$2099	$2799
20-inch Standard	$1399	$2099
20-inch Trinitron	$1999	$2699
Color Portrait	$799	$1499
16-inch Trinitron	$999	$1699
14-inch	$349	n/a
Mirror Monochrome Displays		**w/board**
15-inch Full-page	$399	$519
19-inch Two-page	n/a	$749
19-inch Two-page Grayscale	$699	n/a

MIRROR PRODUCTS. GRAPHICALLY SUPERIOR, CRITICALLY ACCLAIMED.



Tornado Warning

Some companies want you to believe that you have to spend thousands to get professional-level performance in a graphics accelerator. Well, Tornado blows that claim away. Tornado delivers the features and performance of systems costing twice as much; features like QuickDraw acceleration, hardware pan and zoom, support for 24-bit on 21-inch displays, virtual desktop and optional Photoshop acceleration; and does it in a single 7-inch Nubus card. No one else even comes close.



Mirror Tornado	
Tornado Graphics Card	$ 799
ChargeCard Photoshop Accelerator	$ 599
Tornado w/ChargeCard	$1299

Black & White Classics

Nothing beats a black & white display for image sharpness and value. Our monochrome and gray-scale displays (Full-page and Two-page models) are available for most Macintosh models, starting at just $399.

MacUser RATED
MacUser
July 1993
Two Page Display

MacUser RATED
Full Page Display

The Experts Agree

It's no accident that Mirror products get great reviews; we've spent the last 9 years striving to make them the best value in the business. But we don't do it to get good reviews; we do it so you will be happy with your new Mirror product. Not just today, but for years to come.

Order Direct Anytime
800-643-4142
Order by Fax at 612-832-5709

MIRROR
The best thing next to your Mac™

5198 West 76th Street, Edina, MN 55439 USA • fax 612-832-5709 • tech support 800-323-9285

All trademarks are property of their respective holders
All prices subject to change. Prices are for US orders only; call for international pricing

Media: MRMD0694

Circle 58 on reader service card

Expert Graphics

GRAPHICS PROFESSIONALS SHARE THEIR SECRETS

by Cathy Abes

Artist: Los Angeles–based illustrator and animator David Peters specializes in collage. His work has appeared in such magazines as *Movieline Magazine*, *Electronic Entertainment*, and *New Media*, as well as on album covers and movie posters.

How It Was Done: For the illustration that appeared in last month's feature article on copyright issues, "Are You Breaking the Law?," Peters began by taking two photographs of a torn-off magazine cover depicting Arnold Schwarzenegger—a close-up of his face, for placement on the canvas, and an angled shot of the whole cover, for placement on the floor. Peters cut the cover out of the photo with an X-acto knife and placed it on a white board to scan it. In general, he finds this technique to be faster than using the magic wand or the lasso to select parts of a scanned image in Photoshop, and it gives him more control over the image's edges. In this case, he cut out the image to maintain the cover's torn edge. After scanning the cover, he used the perspective tool to match the angle of the floor.

Next Peters scanned in the close-up shot of Schwarzenegger. As with each of the other scanned elements, he adjusted the image with the Levels command, moving the right-hand Input Levels triangle to the left to whiten the background and lighten the entire image. After selecting the head with the lasso, he deleted the background. Because the terms involved in using Schwarzenegger's likeness were so restrictive, Peters completely altered the image so that it was no longer recognizable as Schwarzenegger's face by substituting the eyes, mouth, nose, and ear from another photo. Because the illustration was meant to show how disparate elements from different sources can be combined to create a new image, Peters blended some of the facial elements more than others.

Peters scanned in a photo of his own car and then added a fin by stretching, scaling, and distorting the rear fender. Then he sized and posed the car over the canvas and saved it as a separate file. m



1 The photograph Peters took of the magazine cover shot of Arnold Schwarzenegger, which he scanned into Photoshop.

COVER PHOTO BY GREG GORMAN



2 Using the perspective tool, he widened and stretched the top of the head to change Schwarzenegger's characteristic short cut to a longer hairstyle; then, still using the perspective tool, he pulled down the chin to elongate the face, and used the distort tool to tuck in the right jawline.



3 The facial parts taken from their original owner and awaiting transplantation to their new home. Peters used the same technique for each element: selecting it with the lasso, cutting it out, then making it into a floating selection on the face-in-progress and resizing and shaping it to fit.

THE TOOLS

Hardware: Mac IIfx with 32MB of RAM; 170MB internal hard drive; 1.2GB external hard drive; SyQuest 44MB removable-cartridge drive; 128MB magneto-optical drive; 19-inch SuperMac RGB monitor with PDQ 24-bit accelerator board; Microtek MSF-600ZS color scanner.

Software: Adobe Photoshop 2.5.1.





5 The scanned photo of the artist's car—a blue 1954 Nash Metropolitan convertible—destined to be altered in shape and color.



4 With the scale tool he squeezed the eyes to make them fit the new face; then he used the airbrush and smudge tools to blend them with the rest of the face. He intentionally left the right eye's rough edges showing because he wanted the eye to look like what it was—a grafted facial element.



7 Once he had correctly positioned the fin, Peters used the rubber stamp to clone the reflection from the fin onto the lower portion of the car to make it blend in.



6 To make the fin, Peters cut out the rear fender, copied it, and stretched it vertically with the rectangular marquee (from the Effects submenu under the Image menu). Then, using the scale tool (Effects), he scaled the fin up vertically to elongate the selection, grabbed the top left corner, and stretched it out using the distort tool (using distort alone would have made the fin too fat).



FreeHand Illustrator

The two top PostScript draw programs face off

MW LAB

BY DEKE McCLELLAND

Until recently, Adobe Illustrator and Aldus FreeHand seemed to be operating under some kind of pact. Illustrator clearly catered to the select, free-form drawing crowd, offering a dynamic pen tool, great text-manipulation capabilities, and a smattering of small-document-creation options such as automated charts and graphs. Meanwhile, FreeHand went after the more down-to-earth schematic artists by supplying grids, numerical object positioning, independent layers, and the ability to draw and edit in the preview mode.

Then, in late 1993, Adobe went for the jugular with Illustrator 5.0. The revised program offers multiple undos, object-alignment options, automated gradations, layers, and drawing in preview mode—in short, Adobe added just about everything Illustrator had been criticized for lacking in the past. Perhaps deciding that the best defense was an aggressive counterattack, Altsys (which writes FreeHand for Aldus) rebounded by bolstering version 4.0's text-handling and document-creation capabilities so they not only surpass those in Illustrator but in many ways outperform similar features in Aldus PageMaker and QuarkXPress.

Suddenly, things have gotten very exciting in the world of object-oriented graphics. In fact, FreeHand and Illustrator have become so powerful and well matched that it's more difficult than ever to decide which program is right for you.

(At press time, things had become even more exciting than we originally thought. On March 15, Adobe and Aldus announced a definitive agreement to merge. Both FreeHand and Illustrator will continue to be sold and supported by the newly formed company, at least for now. For more information on the merger, see *News*, in this issue.)

To help you sort it all out, the "Drawing Distinctions" table offers a detailed, side-by-side comparison of both programs in seven major areas. In this table the usefulness and implementation of over 100 features and tools that are found in both applications are graded from A to F. I have graded the programs only on



Tom Ward is a free-lance artist who originally created this illustration in FreeHand 3.1. He revised it using version 4.0. To create the stars in the background, Ward double-clicked on the polygon tool, then used the sliders to set the number of points and the acuteness (pointiness) of the stars. He created the stars by clicking and dragging; the more you drag a star, the larger it gets. Depending on the direction in which you want a star to rotate, you can drag it either clockwise or counterclockwise. After selecting a star, he opened the Inspector floating palette, clicked on the fill icon and used the slider to select a radial fill of purple at the edge to white in the center. For some of the stars, he dragged and dropped yellow onto the star's edge to change the fill to a yellow-to-white gradient. Then he used the Locate Center tool to change the center of the radial fill.

the features that differ significantly between the two programs, as there are hundreds of functions—rotating and skewing objects, creating irregular text blocks, and printing to high-resolution imagesetters, to name just a few—that perform roughly the same in both programs. The article focuses on the main distinctions between the two applications in the seven categories.

In addition, Macworld Lab performed a battery of tests on FreeHand and Illustrator to see how they handle such tasks as screen redraw, preview, and printing (see "Putting FreeHand and Illustrator to the Test").

Finally, it should be noted that this article reviews only the 680X0 versions of FreeHand and Illustrator. During the time we performed our tests, final Power Mac releases of both programs were not available. However, as part of our reporting on the Power Mac introductions, Macworld Lab tested a beta Power Mac version of FreeHand 4.0 on a Power Mac 7100/66 and found it to be overall 2.4 times as fast as 680X0 FreeHand on a Centris 650 (see "Power Mac Software," *Macworld*, May 1994). For more information on the Power Mac upgrade of Adobe Illustrator, see *Graphics* news in this issue.

Interface, Setup, and Compatibility

This is one of the areas in which Illustrator and FreeHand differ most. Illustrator is far superior in controlling the display of artwork on screen, permitting you to preview a stationary object independent of its neighbors; hide objects and selection outlines; and continue working even while the program is previewing complicated artwork. But FreeHand has better document-setup capabilities and a slew of import and export options that Illustrator lacks.

FreeHand 3.0 veterans may find themselves cursing 4.0's new interface nearly as often as they praise it. Perhaps for the better, FreeHand has shed such questionable features as numerical control-handle positioning and automated trapping spreads. However, it has also changed common keyboard commands, for example, ⌘-M, so that they produce different results; dropped items, such as kerning values, from the information bar; killed useful functions, like aligning existing objects to the grid; entirely abandoned support for such attributes as vertical text alignment; and randomly deposited hundreds of unrelated functions into the new, multipaneled Inspector palette—all of which is likely to throw longtime users for a loop.

By contrast, Illustrator has changed the way its masking feature works but has otherwise limited its interface changes to additions and enhancements. This is not to say Illustrator is without its share of interface blemishes. The Filters menu is as much of a mishmash as the Inspector palette. But at least the Filters commands represent new features, not changes to existing features, an important distinction.

Drawing and Editing

When it comes to drawing and editing, Illustrator and FreeHand are cut from the same fabric. But striking differences remain. Illustrator offers the smoother pen tool, while FreeHand's new bezigon tool is slightly more functional, supplying access to the frequently useful connector point. FreeHand now provides a real tool for drawing regular polygons and stars, while Illustrator buries the function in a remote recess of the Filters menu. Both programs provide calligraphic freehand tools that react to pressure-sensitive input, but only Illustrator includes cap

MW LAB

Putting FreeHand and Illustrator to the Test

We tested how FreeHand and Illustrator handled two different kinds of documents. The first document was a color drawing filled with gradations, object blends, tile patterns, masks, text on a curve, and complicated paths. The second was a page layout with linked text blocks, display type, and a placed color EPS image. We tested on a Centris 650 with 16MB of memory in 24-bit color mode (using a SuperMac Thunder II GX•1360). We printed on an Apple LaserWriter IIg with and without PhotoGrade and FinePrint, and with both LaserWriter Drivers 7.0 and 8.0.

Smaller bars are better. Times are in seconds.

SCREEN REDRAW

We performed a variety of zooming and scrolling tests in the Preview mode to determine how quickly the program would redraw the entire document.

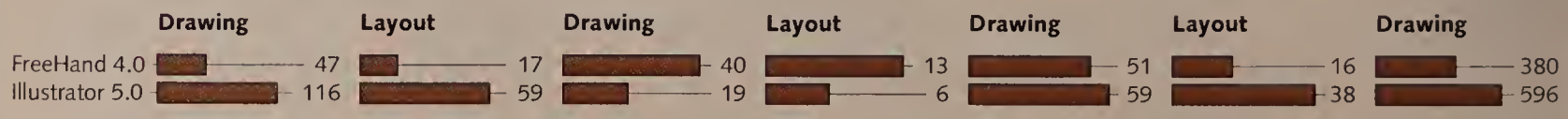
KEYLINE/ARTWORK TASKS

These results show how efficiently the programs moved, scaled, rotated objects, and redrew the affected portions of the screen. Illustrator calculated the tasks faster than FreeHand did, which is apparent in Keyline/Artwork Tasks (where screen redraw is not a factor). In Preview mode FreeHand's faster screen redraw more than made up the difference.

PREVIEW TASKS

PRINTING

Illustrator was slower in all tests. But with LaserWriter 8.0, its performance came close to FreeHand's.



Drawing Distinctions

	Grade	FreeHand 4.0	Grade	Illustrator 5.0
INTERFACE, SETUP, AND COMPATIBILITY	**B**		**C**	
Screen display	**D**		**A**	
Interruptible screen redraw	C	Must press ⌘-period to interrupt preview.	A ✦	Automatically pauses if it detects so much as a mouse-click.
Preview selection only	D	Works only while mouse button is down.	A	While in this special mode, you can select objects to preview them.
Display preferences	B	Control display of gradients and TIFF.	C	Control display of EPS images and tile fills, but not gradients.
Crosshair cursors	F	Big cursors can impair view of illustration.	A ✦	Available when caps lock key is pressed.
Hide objects	C	Must hide all objects on a layer together.	A	Hide any selected object.
Selection outlines show layering	F	Can't tell which layers selected objects are on.	A ✦	Selection outlines are colored according to layer.
Navigation	**B**		**B**	
Levels of magnification (in percent)	A ✦	12–800; 7 increments, plus custom.	B ✦	6.25–1600; 17 increments.
Scrolling	A	Scrolls in single-pixel increments.	C	Scrolls in 40-pixel chunks.
User-definable views	F	Must scroll and zoom manually.	A ✦	Hides, shows, and locks layers; remembers preview settings.
Create multiple views of single document	F	Limit of one window for each illustration.	A	Can view the same portion of a drawing at two zoom ratios.
Levels of undo	A	100; fewer than Illustrator, but anything over 10 is gravy.	A ✦	200
Switch applications when dialog box is open	A ✦	Convenient feature.	F	Included in version 5.0.1.
Interface consistent with previous versions	C ✦	All kinds of disconcerting changes.	B	Mostly works as before; Filters menu is a mess.
Tools, menus, and palettes	**B**		**B**	
Access tools from the keyboard	A	Can access all drawing tools.	C	Less than half are accessible.
⌘ and option keyboard equivalents	C	Lacks equivalents for Preferences, Close, and Output Options, justification and leading, and Don't Save.	B	Lacks equivalents for masking or converting text to paths.
Options automatically highlight in palettes	C ✦	Only when you option-click with a transformation tool.	A ✦	Palettes intelligently respond to commands and other operations.
Collapse palettes	B ✦	Collapse down so only title bar is visible.	C ✦	Collapse midway only.
Document setup	**A**		**D**	
Maximum artwork size (in inches)	B ✦	54 × 54, 30 letter-size pages	A ✦	120 × 120, 154 letter-size pages
Page scrolling	A ✦	Page-navigation buttons modeled after PageMaker's.	F	Must scroll manually.
Add, move, and duplicate pages	A ✦	Full suite of page-control options.	D	Move page tiles only.
Mix page setups within a single document	A ✦	FreeHand is the one and only.	F	All pages must be the same size.
Importing and exporting	**A**		**C**	
Import/export competitor's formats	B ✦	No support for Illustrator 4.0 for Windows or 5.0.	F	FreeHand doesn't publish its file format.
Opens its own file formats	C ✦	Doesn't recognize FreeHand 1.0 files.	A	Supports all previous version files.
Paste PICT objects from Clipboard	A	Great for converting Excel charts to PostScript artwork.	F	No support for PICT objects.
Export to PICT format	A ✦	Exports both objects and images.	C	Exports PICT images via Clipboard only.
Open and edit EPS files	A	EPS files can be editable or uneditable.	B	EPS files are always editable.
Import and modify TIFF images	A	Can modify gray-scale images only.	F	That'll be the day.
Import Photoshop paths and masks	B	Must save paths and masks to disk.	A	Can transfer paths via Clipboard.
DRAWING AND EDITING	**B**		**B**	
Drawing tools	**C**		**B**	
Pen-tool performance	B	Path tracking is as jerky as a stop-action animation.	A	Poetry in motion.
Connector point	A	Provides for smooth transitions between segments.	F	Corner and smooth points only.
Regular polygons and stars	A ✦	Can draw, but from center only.	B ✦	Can't draw shape; must specify numerically.
Spirals	F	Not offered, but you're not missing much.	B ✦	Paths get squarish toward center; again, must specify numerically.
Calligraphic freehand tool	B ✦	No cap or join options for lines.	A ✦	Works nicely; has cap and join options.
Automatic tracing tool	C	Lacks precision-tolerance controls.	D	Works on one path at a time; traces dark and light areas only.
Graphing tools	F	Not offered.	B	Can't create horizontal bar graphs.
Reshaping paths	**B**		**B**	
Select object hidden behind selection	A	Control-click to select down stacking order.	B	Turn off Area Select option or exit preview mode.
Edit rounded corners	C	Applicable to rectangles only.	B ✦	Can't easily adjust corners once they're rounded.
Convert points	B	Must position control handles after converting.	A	Can convert and position control handles in one operation.
Add/delete points	A ✦	Automatically deletes extraneous points.	B	Requires special tool; no control over handle placement.
Split segments	A ✦	Can cut across multiple paths with the knife tool.	B	Can split only one segment at a time with scissors tool.
Drag segments to reshape path	A ✦	By option-dragging, you can even bend straight segments.	B	Dragging straight segments moves them.
Automatic center point	D	Rectangles and ellipses only.	B ✦	Not a true center; based on bounding box.
Automatic handle placement	A	Automatic curvature function is great for new users.	F	Manual positioning can be particularly difficult for beginners.
Combining paths	B ✦	Subtracts back path from front only.	B ✦	Some path operations require FPU
Guides, rulers, and measurements	**C**		**B**	
Grids	B ✦	Can't automatically align an object to the grid.	F	Must build grids manually using guides.
Custom guidelines	F	You can't send path to guide layer.	A	You can edit along a circle or irregular path.
Ruler-tracking lines	A	Tracks entire object when dragging.	C	Tracks cursor only.
Measure distance between two points	C	Have to drag one point onto another, then undo.	A	You don't even have to use measure tool.
Information bar	B ✦	Doesn't monitor text formatting.	A ✦	Better than FreeHand's.
Aligning objects	**B**		**B**	
Snap to point	B ✦	Can assign sounds to snaps, which can prove annoying and definitely make it hard to work while on the phone.	A	Program changes the appearance of the cursor and displays the word *Snap* in the information bar.

Grade Key ✦ = *New or significantly altered feature.* *A = Works like a champ.* *B = Lacking in some respect, though still quite useful.* *C = Frustrating implementation; requires more work than it ought to.* *D = Barely usable, thanks to terrible implementation.* *F = Feature is absent.*



Val Cohen is an illustrator and FreeHand beta-tester who also runs the computer graphics systems for the *Orange County Register* in Southern California. This illustration originally appeared in the *Register* for the opening of the Richard M. Nixon Presidential Library in Yorba Linda, California. Cohen reworked the illustration in FreeHand 4.0.

Using a floating palette, Cohen was able to change the color of a wall—from a flat blue-gray to a graduated fill that blended to white—simply by selecting the wall and dragging and dropping a gradient onto it.

Cohen could quickly cut a window out of the wall, since FreeHand now lets you select two objects and remove one from the other using the Punch command. Creating the zigzag wall was a simple two-step operation: he selected all the shapes he wanted to combine and chose the Union command (Arrange > Path Operations).

and join options for specifying the appearance of ends and corners.

The tracing tool is the only real disappointment in either program. Although some minor controls have changed—FreeHand dropped some options between versions 2.0 and 3.0—the tools in both programs are nearly identical to their original incarnations. They detect only two shades (light and dark), and they always result in closed shapes, never open lines. If you plan on converting many scans to drawings, you really have no choice but to buy Adobe Streamline ($199).

Transformations and Effects

In FreeHand 3.0, you could move an object numerically by pressing ⌘-M, entering a couple of values, and pressing the return key. In version 4.0, you have to press ⌘-M, click on the move icon in the Transformation palette, press ⌘-tilde (~) to activate an option box, enter the values, and press return.

Meanwhile, Illustrator's new plug-in filters provide access to several automated special effects, many of which FreeHand has not implemented. For example, Illustrator provides three filters that move control handles and points randomly to jazz up path outlines. You can even twirl a path around a central point, in much the same way as with the Twirl filter in Adobe Photoshop. Unfortunately, Illustrator requires you to double and even triple the number of points in the path to ensure the success of the filter, and even then it frequently disappoints.

Formatting Text

For more than six years, Illustrator and FreeHand have cut themselves off from a variety of capabilities because both programs lacked support for the modest tab character. To Illustrator, tabs are still taboo, and as a result, to create a simple hanging indent you must wrap text around a vertical line.

FreeHand 4.0, on the other hand, recognizes tabs, and it also allows you to divide a text block into rows and columns to create fully functioning tables complete with multiple-line entries. You have to go to three different places in the Inspector palette just to add a paragraph rule; otherwise FreeHand is a fantastic choice for creating lists and tables.

TEN TASKS FREEHAND DOES BETTER THAN ILLUSTRATOR

1. Navigate in the preview mode. FreeHand is significantly faster in preview mode, and you can scroll in single-pixel increments and zoom to precise view sizes.

2. Blend objects. After blending between two objects, you can edit one or the other, and FreeHand automatically recalculates the blend. In Illustrator, you have to delete the original blend and start over.

3. Design multipage documents. Except for a spelling checker and automatic page numbers, FreeHand has everything it takes to create small, graphics-intensive documents.

4. Create tables. Besides supplying a wide array of tab-stop options, FreeHand enables you to divide a text block into rows and columns, making it one of the most flexible programs for making tables.

5. Draw schematics. FreeHand is still the better program for precisely positioning points and objects. Most essential, FreeHand provides a grid; Illustrator does not.

6. Import and manipulate TIFF images. FreeHand satisfies TIFF fans by letting them not only import TIFF images but also control on-screen image resolution, adjust brightness levels, and colorize gray-scale and black-and-white artwork.

7. Assign colors to objects. FreeHand 4.0 lets you drag and drop colors to change a stroke or fill, adjust the direction of a gradient fill, and reposition the center of a radial fill, all without so much as selecting the affected object.

8. Print custom halftone patterns. Only FreeHand allows you to change the frequency and angle of halftone patterns assigned to selected objects.

9. Trace imported images. FreeHand's automatic tracing tool is inadequate. But when it comes to tracing bitmapped images by hand, FreeHand's template controls leave Illustrator's in the dust.

10. Design arrowheads. Unlike in Illustrator, where you select from a handful of predefined dingbatlike arrowheads and then scale them to size, FreeHand gives you the absolute freedom to draw your own arrowheads.

Drawing Distinctions (continued)

	Grade	FreeHand 4.0	Grade	Illustrator 5.0
Position points numerically	A	✦ Dropped control-handle coordinate.	F	Must position points manually.
Drag path by its center point	F	Snaps to stationary center point only.	A	Great for snapping and aligning.
Align points and paths	B	Align whole paths only.	A ✦	Average command aligns points; Align Objects filter aligns paths.
Distribute paths	A	Distributes according to sides, center, and width.	B ✦	Center distribution only.
Lock and unlock objects	A	Can selectively unlock paths.	B	Must unlock all locked objects at once.
Align and snap to locked objects	A	Can select locked objects and use them in operations.	F	Anything locked is untouchable.
TRANSFORMATIONS AND EFFECTS	**C**		**B**	
Moving, scaling, rotating	**C**		**B**	
Move numerically	D	No direct distance and angle options; also harder to use.	A	Supports direct and indirect distance values.
Resize without using special tool	A	Can drag corner of shapes and groups.	C	Can drag sides of rectangle with direct-selection tool.
Transform numerically	A	✦ Can click in document to set origin point.	B	Can't numerically specify origin.
Set transformation origin point	B	Set origin point during drag; must reset each time.	A	Click to set origin point; can then use repeatedly.
Scale and rotate multiple objects	F	Must transform each object independently.	A ✦	Via Scale and Rotate Each filters.
Free-form distortion	F	No such option.	C ✦	Must perform inside cramped dialog box.
Clones and copies	**C**		**B**	
Transform and clone simultaneously	F	Requires separate operations.	A	Using the option key or the Copy button.
Paste behind or in front of selected object	B	Paste behind only.	A	Can do both.
Repeat series of transformations	A	Repeats several transformations performed in a row.	C	Repeats last transformation only.
Automated effects	**C**		**B**	
Edit object blends	A	Amazingly useful capability.	D	Can reblend colors using filter, but that's it.
Blend between geometric shapes	C	Must ungroup the objects before blending.	A ✦	No ungrouping necessary.
Randomize path outlines	F	Lacks special-effects filters.	A ✦	Roughen, Scribble, and Tweak filters.
Expand and contract segments	F	Ditto.	A ✦	Bloat and Punk filters.
Twirl path outlines	F	Ditto, again.	C ✦	Filter requires additional points but produces rough results.
Trace paths around stroke weight	A	✦ Converts to straightforward compound path.	C ✦	Converts to single path, which is difficult to edit.
Offset path outline	B	✦ Changes original.	A ✦	Clones and offsets, keeping original.
FORMATTING AND MANIPULATING TEXT	**B**		**C**	
Entering, importing, formatting	**C**		**B**	
Text tool responsiveness	C	Program sometimes delays before responding to text entry.	A	Always reacts immediately.
Single-line text blocks	B	✦ Can avoid obtrusive tab ruler by creating text on a path.	A	Point text accommodates headlines and logos.
Em-, en-, and thin-space characters	A	✦ Same keyboard equivalents as in PageMaker.	F	Standard variable space only.
Insert line and column breaks	A	✦ Same keyboard equivalents as in Microsoft Word.	F	Hard returns only.
Import formats	C	✦ Text only and RTF.	A ✦	Text only, Word, MacWrite II, WriteNow, WordPerfect, and RTF.
Search and replace	F	No such function.	A	Can search for whole words; feature is case sensitive.
Location of character options	C	✦ Character options split between two palettes.	A	Everything is in Character palette.
View kerning information	C	✦ Hidden in Inspector palette.	A ✦	Information bar is useful for monitoring progress.
Prohibit hyphenation of selected word	A	✦ In character-level portion of Inspector palette.	F	Must force the word to the next line with a carriage return.
Control letters before and after hyphen	F	Not an option.	A ✦	Useful for centering hyphens and avoiding isolated syllables.
Type on a path	B	Characters can rotate or skew with path or remain upright.	B	Automatically avoids crimping and spreading characters.
Paragraph-level formatting	**B**		**B**	
Change justification from keyboard	F	Have to use commands or palette controls.	A	Just as in PageMaker or QuarkXPress.
Justify last line	A	✦ Conditional function affects only those lines that extend into Flush Zone.	B	Function is either on or off.
Control ragged-line width	A	✦ Can specify minimum length of shortest lines.	F	Ragged lines use standard spacing.
Hanging punctuation	C	✦ Ignores parentheses and en and em dashes.	B	Ignores parentheses.
Paragraph spacing	A	✦ Before and after spacing supported.	B	Can specify spacing before paragraph only.
Lists and tables	**A**		**D**	
Hanging indents	A	✦ Same as in a page-layout program.	C	Only via cumbersome text-wrap technique.
Tabs	A	✦ Permits multiple lines of type between tabs.	F	Usually treats tabs like carriage returns.
Paragraph rules	D	✦ Three-step, nonintuitive process.	F	Must be drawn manually.
Divide table into rows and columns	A	✦ Automatic row and column controls.	F	Columns must be separate text blocks; can't tab between them.
Flowing text	**B**		**A**	
Link text blocks	A	✦ Can link standard text blocks to text on a path.	B	Cloning block with direct-selection tool is convenient.
Reflow text inside linked blocks	C	✦ Must manually redraw links.	A	Change stacking order; rear text block is first in link.
Cut any block from link with text intact	C	✦ Cumbersome to separate an interior block.	A	Cut and paste.
Block-level formatting	**A**		**D**	
Format text by dragging handles	B	Applies to standard text blocks only.	F	Points around text block don't affect formatting.
First-line leading	A	✦ Nice touch.	F	Tightly leaded text may exceed top of text block.
Prevent widows at the top of columns	C	✦ In multicolumn blocks only; doesn't work across links.	F	Must eliminate widows manually.
Automatically shrink text block to fit contents	C	✦ Reduce text block (not rectangles) only.	F	Not available.

Grade Key ✦ = *New or significantly altered feature.* *A = Works like a champ.* *B = Lacking in some respect, though still quite useful.* *C = Frustrating implementation; requires more work than it ought to.* *D = Barely usable, thanks to terrible implementation.* *F = Feature is absent.*



David Flaherty, a New York City artist who uses Illustrator, created the original version of this image for the cover of a *BusinessWeek* advertising brochure in Illustrator 3.2; using Illustrator 5.0, he recently updated the image for inclusion in his portfolio. To create a shadow behind the globe inside the lightbulb on the far right, Flaherty used Illustrator 5.0's Drop Shadow filter. He used Illustrator's Star filter to create the shape behind the man's head.

To make the dollar signs inside the middle left lightbulb appear to be curving around the bulb, Flaherty used the Twirl command.

Flaherty created a radial blend for the numbers inside the leftmost bulb; by selecting all the numbers and filling them with the gradient, he was able to distribute the blend in each shape the same way.

Illustrator 5.0 introduced the concept of automatic copyfitting to drawing programs by allowing you to change the characteristics of a single-line headline set in a Multiple Master font so that the text fits onto a single line. Unfortunately, Illustrator doesn't warn you if the text block is too narrow or too wide for the function to work properly. FreeHand has a similar feature that expands and contracts letterspacing, but it's even less reliable than Illustrator's.

FreeHand 4.0 broadened the idea of copyfitting to incorporate an entire text block. FreeHand can automatically increase or decrease type size and leading to fit a block of text into the confines of a given space. You can also balance the number of lines of type between multiple columns. Unfortunately, this second function doesn't work across linked text blocks, an ability that might prove handy when formatting documents with two or more pages.

Fills, Strokes, and Color

Illustrator takes the cake when it comes to automated gradations. Using the gradient tool, you can position the first and last colors of the gradation inside a filled object. You can also drag a single gradient across multiple selected paths. And if you click with the tool, you can adjust the focus point of a radial gradation so that the center of the fill is closer to one side of the radius than another.

FreeHand 4.0 lets you drag and drop colors onto objects to change their strokes and fills even when they aren't selected. Illustrator also lets you change the attributes assigned to deselected objects, but it means using a special tool (the paint bucket). Also, if you want to change fill and stroke attributes independently, you have to fiddle around with a bunch of dialog box options.

The good news about Illustrator's paint bucket is that it makes it easy to copy all attributes from one object and immediately apply them to another, regardless of how involved the attributes are. In FreeHand, your best bet is to save the attributes to a graphic style, then apply the style to the second object—a four-step process.

In addition to providing outstanding gradient-fill options, Illustrator is alone in automating color adjustments. Using plug-in filters, you can blend colors across a series of objects, whether or not the objects were created with the blend tool. You can also invert the colors in an object, though the operation works by inverting cyan, magenta, and yellow values only; shades of black and white remain unaffected. And you can apply Pathfinder filters to combine paths so that it appears as if the colors of one object mix with those of the object behind it—a means of faking QuickDraw transfer modes with a PostScript printer.

Illustrator also provides filters for increasing and decreasing color saturation; at least, that's what these filters are supposed to do. In reality, they merely increase or decrease CMYK values, alternately darkening or lightening the colors. If the filters performed as advertised, you could decrease the saturation of colors to convert them to gray values or bump up the saturation to bring out stronger hues. As it is, these options are a wash.

Output

Both FreeHand and Illustrator avoid PostScript printing errors by splitting

TEN TASKS ILLUSTRATOR DOES BETTER THAN FREEHAND

1. Draw complex paths. You can't help but create artistic stuff when the pen tool is such a work of art. Custom guidelines, point-alignment functions, and a first-rate information palette make creating complex paths even dreamier.

2. Create gradient fills. With 32 colors, complete midpoint control, and the ability to exactly position beginning and ending colors inside objects, how could you go wrong?

3. Mask objects and images. Only in Illustrator can you edit the contents of a mask without first taking the mask apart. You can also add paths to an existing mask in any order you please.

4. Experiment with automated effects. Illustrator's new plug-in filters allow you to experiment with special effects in ways FreeHand doesn't permit.

5. Scale and rotate. When it comes to scaling and rotating, Illustrator is tops. You can reuse a single origin, scale or rotate with respect to multiple independent origins, and transform and clone in a single operation.

6. Combine paths. Illustrator's Pathfinder functions are more numerous and flexible than their equivalents in FreeHand (an FPU is required, though).

7. Format characters. Illustrator allows you to change font, type size, leading, baseline shift, and other character-level formatting attributes without once moving your hands from the keyboard.

8. Select objects. In addition to a slightly more flexible selection model that better accommodates simple shapes and masked elements, Illustrator provides filters for selecting objects automatically based on fill, stroke, or line weight.

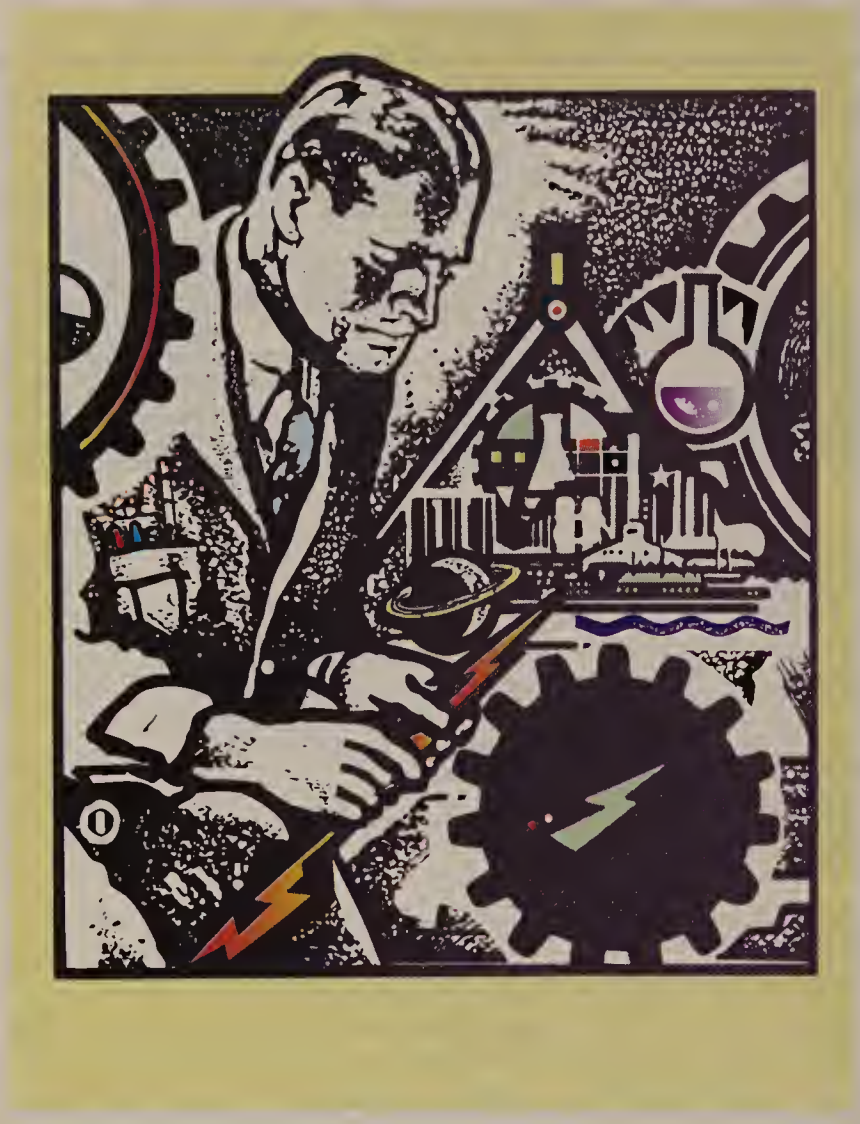
9. Swap text with other programs. Because Illustrator supports the Claris XTND system, you can import and export several common text formats.

10. Create graphs. Illustrator's dedicated graphing tools make it one of the best programs for turning stagnant facts and figures into dynamic info arts.

Drawing Distinctions (continued)

	Grade		FreeHand 4.0	Grade		Illustrator 5.0
Adjust text-wrap standoff	A	✦	Specify negative and positive standoff values.	C		Via paragraph indents; no vertical spacing controls.
Inset type with respect to text-block outline	A	✦	Negative and positive values are permitted.	F		Type always exactly fills text block.
Specify text-block dimensions numerically	A	✦	Specify location, width, and height.	C		Only during creation by clicking with the rectangle tool.
Copyfitting text	B	✦	Works automatically, across all links.	D	✦	Must change type size and leading by hand.
FILLS, STROKES, AND COLOR	**C**			**B**		
Defining fill and stroke	**B**			**C**		
Tile patterns	A		Very straightforward.	C		Hard to define tiles, but 60 predefined patterns included.
PostScript and texture fills	C		Limited amount; don't display properly in preview mode.	F		Limited to tile fills.
Arrowhead editor	A	✦	Draw your own in fully functioning editing window.	C	✦	Scalable, predefined dingbat arrowheads.
Location of fill and stroke options	C	✦	Scattered throughout the program.	A	✦	Centrally located in Paint Style palette with room to spare.
Gradient fills	**C**			**A**		
Colors per gradation	C		2	A	✦	32
Edit gradation in single deselected object	A	✦	Drag and drop color to change color, angle, or center.	D	✦	Can reassign only with paint bucket.
Adjust midpoint	D		Linear and logarithmic variations only.	A	✦	Full midpoint control.
Create gradation between spot colors	F		Must create manually using blend feature.	A	✦	Correctly outputs to color plates.
Name and save gradations	C		As styles only, which includes stroke definitions.	A	✦	Program saves gradations with document.
Share gradations between documents	F		Not an option.	A	✦	Useful when working on related illustrations.
Save gradations to library	F		No gradient libraries.	A	✦	Just draw one of each and save file.
Position colors and focus point in radial gradation	C	✦	Position beginning color only; no focus-point control.	A	✦	Via gradient tool.
Draw gradation across multiple shapes	B		Must first combine shapes into composite path.	A	✦	Select multiple objects, drag with gradient tool.
Assigning attributes	**C**			**B**		
Fill open paths	F		Must clone path, close and fill rear path, stroke front one.	A		Useful for creating indefinite boundaries.
Assign colors to deselected objects	A	✦	Drag color onto fill or stroke of object.	C	✦	Using paint bucket; must specify which attributes are affected.
Copy attributes from one object to another	C	✦	Quickest method involves four steps.	A	✦	Two clicks with the paint bucket.
Select objects according to fill or stroke	F		No automated selection functions.	A	✦	Can even select masks.
Create a style sheet of attributes	B		Must have parent style.	F		Not possible.
Color management	**B**			**A**		
Color models	A	✦	CMYK, RGB, HSL, and HSB (Apple).	B		CMYK and HSB (Apple).
Brand-name color libraries	A	✦	Pantone, Trumatch, Focoltone, Toyo plus DIC.	A	✦	Pantone, Trumatch, Focoltone, Toyo.
Import color	A		Can select colors you want to import from libraries.	B		Must import entire library.
Share colors between all open documents	F		No, but you can combine illustrations in one document.	A		Useful when creating multiple illustrations for one client.
Save color list to custom library	B		Must use special library format.	A		Any illustration functions as library.
Remove all unused colors	F		Not an option.	B		Automatically select all unused colors, then delete.
Color filters	F		Lacks color filters.	B	✦	Blend colors according to position or stacking order.
Masks (clipping paths)	**C**			**B**		
Mask retains fill and stroke	A		This is the way it should be.	D	✦	Restore with filter, though this complicates editing process.
Edit paths inside masks	F		Must cut contents first.	A		Highly versatile feature.
Add paths to existing mask	C		Can only add to front of mask.	A		Can paste in front or in back of any element inside mask.
Use editable text as mask	D		Rectangular text-block outline serves as mask.	A		Characters serve as mask.
OUTPUT	**B**			**C**		
Printing paths and halftones	**A**			**C**		
Split long paths	A		Splits in memory and in EPS definition.	D		Permanently splits paths in document.
Flatness	A		Global flatness now saved with EPS file.	C	✦	Control indirectly using Output Resolution option.
Custom halftone frequencies and angles	A		Specify on object-by-object basis.	D		Apply to entire document using Separator utility.
Control steps in printed gradation	A		Useful for printing quick drafts.	F		No draft setting.
Tile large artwork	C		Must rely on less-satisfying Overlap options.	A		Control exact placement of tiles.
Color separations and composites	**C**			**B**		
CIE monitor and ink calibration	F		Not an option.	A	✦	Borrows settings from Photoshop.
Print color separations	A		All options available from inside FreeHand.	B		Must leave Illustrator and launch Separator utility.
Move document on printed page	F		Must move objects or page instead.	A		From inside Separator.
Add and move crop, registration marks	C	✦	Assign custom registration mark via Color List palette.	A		From inside Separator.
Transfer functions	B		Must customize by editing PPD.	B		Fully customizable, but lacks presets.
Ships with LaserWriter driver 8.0	A		Ships with standard product.	C		Included in CD-ROM version only.
DOCUMENTATION AND PRICING	**B**			**B**		
Manuals and online help	C	✦	Many features ignored in manual.	C		Includes expert techniques, no help available.
Technical support	B		Two wordy voice-mail menus before entering queue.	C		Must go through exhaustive voice-mail menu system.
List price/upgrade	A		$595/$150	A		$595; $695 for CD-ROM/$199; $249 for CD-ROM
OVERALL GRADE	**B**			**B**		

Grade Key ✦ = *New or significantly altered feature.* *A = Works like a champ.* *B = Lacking in some respect, though still quite useful.* *C = Frustrating implementation; requires more work than it ought to.* *D = Barely usable, thanks to terrible implementation.* *F = Feature is absent.*



Chris Spollen used Illustrator 5.0 to create this piece, titled "The Wonder of Innovation."

Spollen created a palette of gradients and saved them for later use. He experimented with all the different gradients, using multiple levels of undo to easily switch between them.

Spollen used a yellow-red gradient for each section of the lightning bolt. First he selected the lightning bolt and selected a linear gradient; after selecting the bottom section, he clicked on the bottom point and used the gradient vector tool to drag the gradient from bottom to top (red to yellow) and then did the same for the middle and the top sections. He customized the gradient inside the gear to blend from yellow to red to yellow.

overly long paths and flattening out complex curves. While FreeHand splits paths in memory and never alters the original document, Illustrator breaks up paths for good when saving and printing, making for some pretty ornery editing sessions. Illustrator has also abandoned the reliable Flatness option for the less straightforward Output Resolution option, which can result in jagged paths when you least expect it.

Some Illustrator 5.0 users have reported being unable to print illustrations containing gradients to some laser printers, imagesetters, and color printers. But the recently released 5.0.1 patch seems to have solved most of these problems. The patch was sent free to all registered 5.0 users and was also posted on CompuServe, America Online, and Adobe's own bulletin board.

When it comes to printing your color separations, Adobe's Separator utility provides more functionality than FreeHand's built-in Print command. If you are armed with a densitometer, you do have specific control over transfer functions when you use Separator; FreeHand, however, limits you to a few presets.

Documentation

The documentation included with Illustrator 5.0 is first-rate. It includes a tutorial, a user's guide, and a separate volume of expert techniques for advanced users. FreeHand's manuals used to be great, but they have suffered in the translation to version 4.0. Many options are described in one sentence or ignored entirely. Complex tasks are treated so briefly, you're frequently left scratching your head.

FreeHand's online help is not much help. If your system is equipped with PostScript font metrics, the text extends beyond the margins of the help window, regardless of how you resize it. Furthermore, the window does not stay on screen while you try out a feature. Quite honestly, I would rather see FreeHand abandon online help and integrate the information into the manuals instead, as Illustrator has done.

Redraw and Performance Speed

Back when Illustrator prohibited editing in the preview mode, some users wondered if Adobe was simply waiting until it could make its screen redraw faster than FreeHand's. But with Illustrator 5.0, we can stop speculating—Macworld Lab tests show FreeHand as the overall winner (see "Putting FreeHand and Illustrator to the Test").

Thankfully, neither program encountered printing errors, and FreeHand printed our two test files in 380 seconds—50 percent faster than Illustrator (at 596 seconds). FreeHand was also faster than Illustrator at redrawing the entire screen—as when zooming or scrolling in large increments—sometimes by as much as 300 percent. For example, FreeHand took 17 seconds to redraw the page-layout document; Illustrator took 59 seconds.

FreeHand and Illustrator took similar amounts of time to perform a suite of common operations in preview mode; Illustrator generally monitored the operation more quickly, but FreeHand made up the difference when redrawing the results. The only case in which Illustrator performed significantly faster than FreeHand was when performing operations in Keyline (FreeHand) or Artwork (Illustrator) mode; in these tests, Illustrator consistently beat FreeHand by 200 percent or more.

Which One's for You?

After examining every nook and cranny of these two powerful programs, I've discovered that—this time around—there is no decisive knockout punch.

If you're not yet locked into one program, though, there are some subtle differences that you'll want to consider. Illustrator is geared toward advanced artists who need precise gradient controls, feel comfortable working in the Artwork mode, find inspiration in experimenting with transformations and special effects, and don't plan on importing images from any program but Adobe Photoshop.

Despite FreeHand's reworked palettes, Illustrator also continues to win my vote as the easier program to use because it does a better job of structuring options in an organized fashion (the one exception being the completely random Filters menu) and making those options available when you need them.

If, on the other hand, you're more interested in creating and printing small documents, editing and copyfitting text and tables, and importing and editing TIFF images, FreeHand is the better of the two. Also, if sheer speed is important, then consider FreeHand.

The two programs are so evenly matched, yet with different strengths, that you might be tempted to buy them both (provided your software budget allows). Let me give you a word of advice, though: Don't. The two programs are similar enough that you should be able to make do with one or the other without much compromise, and there is little that can be done in one program that absolutely cannot be accomplished in the other. **m**

DEKE McCLELLAND spends most of his time writing books on graphics software, including *The Illustrator 5 Book* (Peachpit Press, 1993), *Macworld FreeHand 4.0 Bible*, and *Macworld Photoshop 2.5 Bible* (both IDG Books Worldwide, 1993).

SPECULAR

COLLAGE™

The Image Composition Tool for Adobe Photoshop™

"◆◆◆◆"

"A valuable tool that should be on the shelf of anyone who manipulates images on the Macintosh."

MacWEEK, January 24, 1994



Specular Collage lets you quickly combine high-res images, without using a lot of RAM. Each image is a separate object—even after it's been blended with others. Layout images with the convenience of rulers, guides, image grouping and layers. Enhance your composition with a rich selection of effects such as transparency, automatic drop shadows, feathering, and Photoshop filters. Anything you do in Collage can be changed at any time, giving you total creative freedom!



SPECULAR

TEXTURESCAPE™

SPECIAL PRICE $149!

Design an infinite variety of textures for print, video, & multimedia.



Design the exact texture you want, or one you've never imagined possible! TextureScape gives you the control to design detailed and rich textures, while freeing you to play with color, light, and motion. TextureScape's files take up little disk space (under 30K each), yet textures can be rendered at any size or resolution needed.

TextureScape can also morph between textures! Compose a QuickTime movie of a marble background morphing into your logo. Achieve astonishing effects for your next presentation, video, or multimedia project.



An unlimited collection of textures... for less than the cost of one CD-ROM.

CALL SPECULAR INTERNATIONAL AT 1-800-433-SPEC

Specular Collage™, Specular TextureScape™, and the Specular International logo are trademarks of Specular International, Ltd. Adobe Photoshop™ is a trademark of Adobe Systems, Inc. Macintosh® is a registered trademark of Apple Computer, Inc.
Collage Art by Joseph Kelter / Bad Cat Design, Philadelphia, PA. © 1994Specular International. All rights reserved

Circle 41 on reader service card

EDITED BY DAN LITTMAN

At Work

THE LATEST TOOLS FOR BUSINESS COMPUTING

Pillar to Support Financial Analysis

PILLAR'S FYPLAN IS A CORPORATE-wide budgeting system that stores everything in a unified data repository, thus avoiding the mess of having numerous linked budgeting spreadsheets scattered throughout an organization. FYPlan is designed so that managers can easily drill down through projections or roll them up for a big-picture view. Now Pillar is developing an add-on for FYPlan, called FYControl, for analyzing financial results and comparing actual versus plan.

FYControl shares the FYPlan database, which division managers, line managers, product managers, and others create as they enter sales and cost projections. FYControl is essentially a reporting tool for creating variance and exception reports; projecting results of future or partially completed periods; extracting information about costs and performance of regions, product lines, and so on; and doing other kinds of financial analysis. Managers can control which line-items their staff can access. FYControl provides sorting and summarizing capabilities and can generate "what-if" scenarios based on multiple sets of projections. The program can also accommodate corporate reorganizations that move cost or profit centers in the middle of a period.

FYControl provides a somewhat limited set of calculations, though probably all that anyone would need for the kind of analysis it is designed to perform: it can add, subtract, multiply, divide, and take percentages and absolute values.

Pillar expects to ship FYControl 1.0 in May. Because FYPlan and FYControl require several hierarchically integrated pieces of software, their pricing structure is complex. FYPlan costs about $20,000 for the first five users and about $500 for each additional user; the FYControl add-on is slightly less expensive. Pillar, 415/349-6200.—D.L.



DAVID KAHL

Automation Tool Talks AppleScript

SOUTHBEACH SOFTWARE'S POWERAgent expands on the concept of Mac-automating agent-based utilities pioneered by No Hands Software's Magnet and Charles River Analytics' Open Sesame. PowerAgent goes beyond the two older programs in one very important way: it can automate not just the Finder, but also AppleScript-aware applications. (For more on Magnet, see "Automating the Finder," *News*, *Macworld*, July 1992; for Open Sesame, see "Open Sesame Reads Minds," *News*, September 1993.)

PowerAgent doesn't provide Open Sesame's ability to analyze the tasks you perform on your Mac and then offer to take over doing them for you; instead, you use a point-and-click dialog-box interface to hand-tool what are called Jobs for PowerAgent to perform. But version 1.0, shipping now for $159, has an interface



This PowerAgent Job accesses FileMaker data and calculations to check if inventory is running low.

for including any FileMaker Pro feature in a Job, and SouthBeach is adding support for other AppleScript-savvy applications. Upgrade plans were not set at press time. SouthBeach Software, 305/858-8416, 800/492-7753.—D.L.

The Electronic Routing Slip

BLUERIDGE TECHNOLOGIES HAS UPgraded its client-server document-processing system, Optix Workflow, with tools that enable a user to designate the route a document travels through an office using a point-and-click graphical route developer. Designed to replace the bottleneck-ridden flow of paper documents, Optix Workflow can send documents across a local or wide area network.

Workflow 1.0 required command-line programming. In version 2.0, users can design routes by drawing lines between icons representing users; routes can be designed for such contingencies as skipping someone who fails to acknowledge a document's arrival. Documents can originate in electronic format or be scanned into Blueridge's Optix Network, a document-archiving system.

Workflow pricing begins around $50,000 for an office; with Network, pricing begins around $75,000. Blueridge Technologies, 703/675-3015.

—JOANNA PEARLSTEIN



ROB DUDLEY

Document Conferencing on the Network

COMPUTER USERS WHO NEED TO collaborate may find a solution in Crosswise Corporation's Face to Face, document-conferencing software that lets Mac and Windows users create images of their documents with a special printer driver and then view and edit them together from different locations.

Face to Face is $295 for a two-user pack and can connect two users at a time via high-speed modem, ISDN line, or AppleTalk network. Face to Face can also recognize a user's PowerTalk directory.

Face to Face has tools for navigating, drawing, erasing, and creating text. Each participant's comments are displayed on a separate transparency-like layer over the document. After conferencing is complete, participants can save, print, or forward the edited document.

Unlike videoconferencing, Face to Face requires no special hardware. Crosswise envisions Face to Face as a replacement for faxing or mailing documents that are later discussed by phone—Face to Face users can talk on the phone while viewing and editing the electronic files. Crosswise, 408/459-9060.

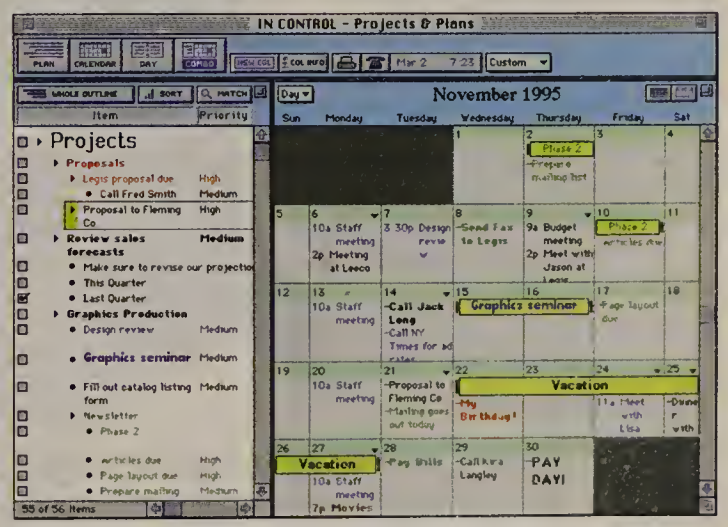
—JOANNA PEARLSTEIN

Control with Flexibility

ATTAIN CORPORATION'S In Control outliner/planner is being upgraded to version 3.0, with support for modifying how information is presented, as well as a long list of incremental improvements.

In Control now has four views that can be reconfigured extensively—for example, you can display the weekly calendar and the new to-do list side by side under the outline. You can also set how many weeks appear in the weekly calendar, and how many months in the new monthly calendar. A new daily calendar allows you to schedule your time hour by hour. The calendar views also provide banners—icons running across multiple days or weeks showing the duration of an event.

In Control 3.0 supports recurring events. Recurring events, like other dated events, are automatically included in the new Appointments and To-Dos columns in the outline view; the two columns are normally hidden, to avoid cluttering the outline, but can be used to sort and select topics. In Control 3.0 should ship in May and will probably list for $129.95. Attain, 617/776-1110, 800/925-5615.—D.L.



In Control 3.0 allows users to create custom views that combine the structured, outline-based to-do–list manager with day, week, and month calendars.

IN BRIEF

■ **Interleaf's New Leaf?** Unix publishing software vendor Interleaf is renewing its on-again, off-again relationship with the Macintosh, the highlights of which include shipping and then dropping a Mac version of its flagship publishing system, and quietly shipping an electronic-document-viewing tool that is similar to Adobe Acrobat and No Hands Software's Common Ground. Now Interleaf has returned with plans for a Macintosh client to Intellecte, which integrates the assembling of structured documents, electronic distribution and viewing, and workflow controls in a client-server system. 617/290-0710.

■ **Multiplatform Sales Software** SalesKit Software has announced Mac versions of its sales-automation products, SalesKit and SalesKit Administration Program (SAP). SalesKit can share information among Macs and DOS and Windows machines, as well as with databases stored on larger systems. SAP allows users to modify SalesKit's features. 314/432-7205.

WANNA SEE WINDOWS SCREAM ON YOUR POWER MAC?



So you finally get your hands on the hottest new Mac and what happens?

Somebody insists that you run Microsoft Windows™ applications.

Don't despair. Just double click on SoftWindows™ **and hang on tight**.

You see, SoftWindows not only lets you use your Mac as a Mac, it also lets you **run thousands of popular Windows programs** – as fast as a 486SX.

You can run DOS programs, too. Not to mention PC network applications such as NetWare, LAN Manager and TCP/IP.

How can SoftWindows be so utterly compatible? Because it **includes Windows 3.1 and MS-DOS® 6.2,** optimized to run at top speed.

And since both DOS and Windows are preinstalled, you don't have to put up with tedious installations.

With SoftWindows, you can copy and paste between PC and Mac applications. You can even **use Macintosh peripherals** – CD-ROMs, printers, modems and more – with PC programs.

Call us today at **800-848-7677 Dept. B**. Or visit your dealer. What you discover will blow you away.

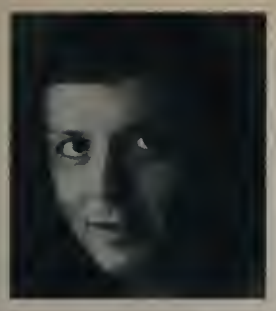
SOFT WINDOWS

Windows Compatibility for the Power Macintosh.

Insignia®

In Europe, call (44) 494 459426.

Circle 68 on reader service card



BY JIM HEID

Working Smart

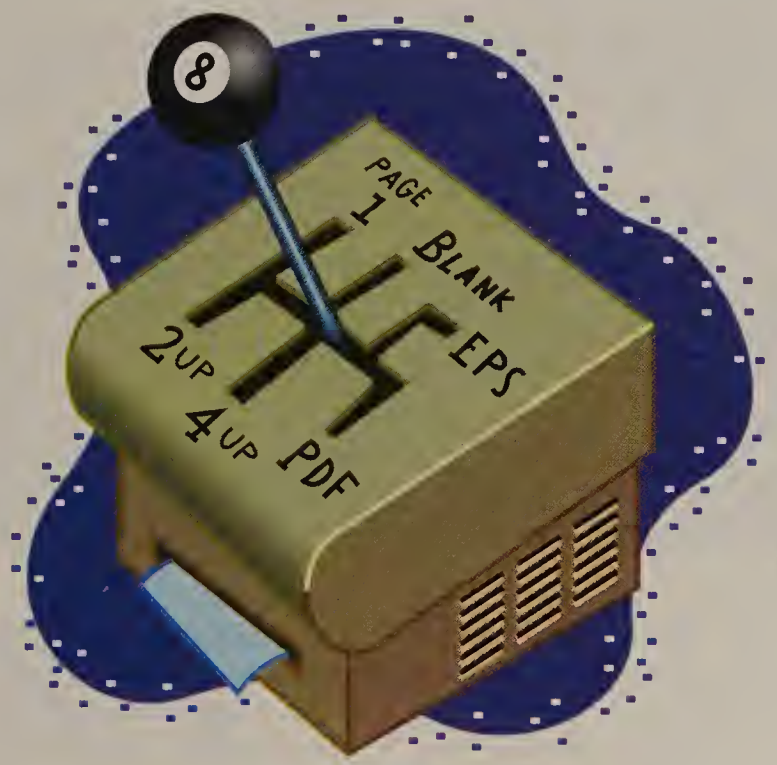
Power Tips for LaserWriter 8

POSTSCRIPT PRINTER PERFORMANCE HAS improved dramatically over the last decade, thanks to faster print engines and faster processors. And the Macintosh's PostScript printer driver—the program that enables the Mac to communicate with a PostScript printer and that you access by clicking on its icon in the Chooser—has also evolved.

The latest driver, called LaserWriter 8 by Apple, and Adobe Printer Driver PSPrinter by Adobe Systems—Apple and Adobe collaborated on the driver's design—provides better all-around printing performance and supports PostScript Level 2 machines. (PostScript Level 2, which most new PostScript printers use, is faster than the earlier PostScript and manages the printer's memory better, among other things. But many of LaserWriter 8's special features are accessible even with older PostScript printers.)

Some of LaserWriter 8's enhancements are aimed at users of color printers and imagesetters, but many of its enhancements are also useful for the Macintosh in a gray flannel suit. For example, the driver can add options to the page-setup and printer dialog boxes that let you access special features found in many printers, such as enhanced resolution, support for multiple paper trays and fax-modem cards, and even duplex mechanisms (which flip paper inside a printer to print on both sides of a page). The key to LaserWriter 8's ability to support unique printer features is each printer's printer description file (PDF), a description of the printer's capabilities—its resolution, paper-handling features, and so on—which LaserWriter 8 reads. (PDF files, also called PPDs, or PostScript Printer Descriptions, reside in the Printer Descriptions folder inside the System Folder's Extensions folder. See the screen image "More Choices Dialog").

This month's column is a guide to the ways business users can take advantage of LaserWriter 8. The most recent version is 8.1.1; its primary improvements to version 8.0 include better TrueType support, better compatibility with Mac applications, improved support for Apple's ColorSync color-management system, and fax logging for fax-equipped printers. If you're using an earlier version of the driver, you can get the PSPrinter driver package with documentation for $24.95 from Adobe Systems (415/961-4400, 800/833-6687). The driver package includes PDFs for many printers; printer vendors usually supply only the PDFs for their own printers, so if you need additional PDFs—perhaps to create print-to-disk files for an imagesetter or other printing device that you don't have—you'll need Adobe's library of PDFs. The driver also comes with the CD-ROM versions of many Adobe products, including Photoshop, Illustrator, and Premiere. (If you don't know what driver version you have, select the driver—it's in the Extensions folder inside the System Folder—and choose Get Info from the File menu.)



Pick Your Paper

More and more PostScript printers include or accept optional multiple paper bins (see "Tray Chic: Paper-Handling Options"). LaserWriter 8 lets you tap these trays in several ways. Two or more trays make it easy to mix and match paper stocks without walking over to the printer and sliding trays in and out. In an office, multiple bins can help you avoid situations such as one person installing transparency stock just as another person begins a 48-page print job.

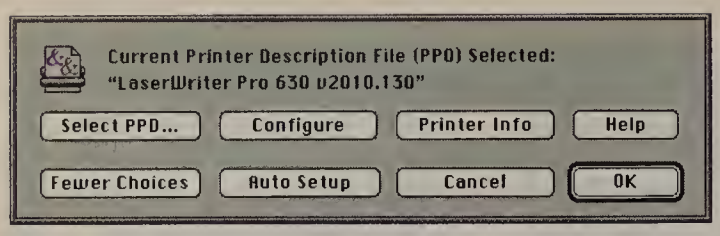
Here are several ways you can put two trays to work.

• **Multipage business letters** Put letterhead in the upper tray and second sheets in the lower one. Then, in the Paper Source area of the Print dialog box, choose Upper for the first page, and Lower for the remaining pages (see "Paper-Feeding Controls"). Here's a variation of this technique for a printer that has one paper cassette and one multipurpose tray, such as Apple's LaserWriter Pro series. Put second sheets in the cassette and letterhead in the multipurpose tray. Then select First From Multipurpose Tray and Remaining From Cassette. If the majority of your letters are only one page, you should reverse this scheme.

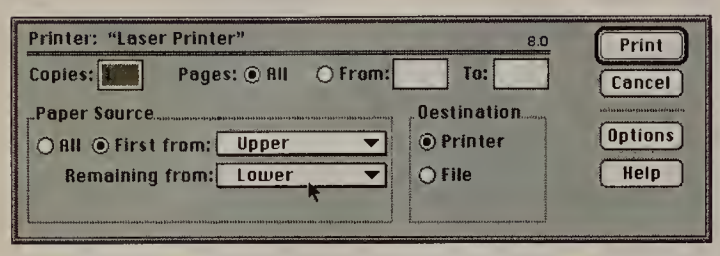
• **Printing rough proofs** Put el-cheapo copier bond in the upper tray and high-quality laser paper in the lower one. When you're proofing a document for typos and errors in the layout, use the upper tray. When you're ready for final output, use the lower one.

• **Paper and transparencies** Put laser stock in one tray and transparency stock in the other. (Check the box your transparency stock comes in to verify that it can be fed automatically—some transparencies must be manually fed.) If your

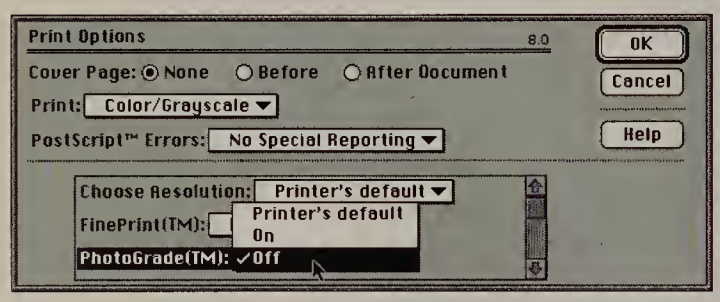
continues



More Choices Dialog This dialog box, which you access by clicking on More Choices in the Printer Setup dialog box, lets you manually select a different PDF (also known as PPD). You might do this when preparing a print-to-disk file using the driver for an imagesetter or color printer that you don't actually have.



Paper-Feeding Controls The Paper Source pop-ups in LaserWriter 8's Print dialog box let you mix and match paper within a print job. Here, the first page of a document will be printed using the paper in the printer's upper tray, while the remaining pages will use the paper in the lower tray.



Exploring Print Options Clicking on the Options button in the Print dialog box reveals another dialog box that lets you control features unique to each printer. Here, the PhotoGrade feature that is provided by many Apple LaserWriters is being disabled for faster printing.

printer has just one paper bin, you can still use the Paper Source options to streamline switching stock. For printing multipage business letters, put second sheets in the paper tray. When it's time to print, choose Manual for the letterhead page and Auto Select for the remaining pages.

- **Color-code documents** Some businesses use different paper colors for common document categories: confidential documents on blue stock, memos on yellow paper, price lists on pink. This, combined with company policies for the color coding—for example, blue documents are never to leave the engineering department—makes paperwork a bit easier to track and manage.
- **Long print jobs** Multiple paper trays not only let you switch between stocks, they can also cut down on refilling trays when you're churning out copy. Fill both bins with the same paper and tell the printer to switch to the second bin when the first runs dry. This is generally the preset option unless you specify otherwise using the printer's front-panel controls.

Printing Thumbnail Pages

LaserWriter 8's Page Setup dialog box contains a pop-up menu called Layout that lets you reduce two or four pages and print them on a single sheet of paper with a black border around each page. You can use this feature to save paper and toner when you're printing simple documents such as text manuscripts or E-mail messages. You'll be surprised at how readable the text remains when it's reduced, especially with two-up printing. Text printed in four-up mode is a bit small—if the bottom rows of an eye chart give you trouble, don't go any smaller than two-up.

The thumbnail option is also a handy way to reduce large documents and save room in your filing cabinet, and it's great for storyboarding your presentations. And for you desktop publishers, two-up printing is a good way to gauge how a two-page spread will appear when it's printed.

(Here's another slick Page Setup feature previous LaserWriter drivers lacked: You can click on the graphic representation of the page—the picture of the dogcow—to replace it with a description of your printer's exact imageable area, that is, how close to the edge of the page your printer can put down toner.)

Print Power

I've already touched on the best new feature of the LaserWriter 8 Print dialog box: the Paper Source options that enable you to bounce between bins. Clicking on the Print dialog box's Options button reveals more options that you can use to fine-tune print jobs and save time in the process (see "Exploring Print Options").

If you're proofing a document that contains scanned images or illustrations with color or gray shades, you can shorten your printing times—often dramatically—by choosing the Black & White option instead of Color/Grayscale. In a similar vein, if your printer has a halftone-enhancement feature such as Apple's PhotoGrade, you can probably reduce printing times by disabling it: click on Options, locate the PhotoGrade pop-up menu, and choose Off. (However, disabling a text-enhancement feature—for example, Apple's FinePrint or Hewlett-Packard's Resolution Enhancement technology—generally does not save on printing time. Here's another efficiency tip. Some color printers still ship with LaserWriter 7.X because printer vendors know that the way LaserWriter 8 saves a job to disk before printing it temporarily uses more disk space than LaserWriter 7.X. To avoid running out of disk space when printing huge files, you might want to keep the old driver installed, using the Chooser to switch between it and LaserWriter 8 as needed. You can mix LaserWriter 8.X and LaserWriter 7.X on a network without problems.)

Options you choose in the bottom portion of the Print dialog box revert to their original, printer-resident settings after you print one document. For instance, if you disable PhotoGrade to get faster output of a given document, the printer reenables PhotoGrade after printing the document.

What's Your Destination?

LaserWriter 8's Print dialog box has buttons in an area labeled Destination that let you send a document to the printer or to a disk file. Desktop publishers often create a raw PostScript disk file when they plan to send documents to a service bureau for high-resolution imagesetter output—the process eliminates the need for the service bureau to have the application that created the document.

LaserWriter version 8.1.1 builds on the print-to-disk feature with an option to create an encapsulated PostScript (EPS) version of a single page within a document. You could use this to create a page-within-a-page effect—for example, to include a page from a report on a presentation slide. The print-to-disk feature makes it possible to export an EPS image from programs that don't provide EPS export.

In the Destination area of the Print dialog box, click on the File button (notice the Print button changes to read Save). In the Pages area of the dialog box, specify the page number of the page you want to save as an EPS file. When you click on the Save button, you'll get a Save dialog box with two EPS Mac options (the EPS Mac Enhanced option yields better results but uses more disk space).

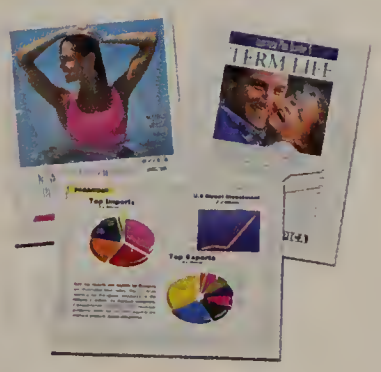
By the way, if your printer contains a PostScript fax card, the Destination area has a third button, for faxing the document. LaserWriter 8.1.1 logs outgoing faxes. (The LaserWriter Select 360 PostScript Fax Card sells for $309. The LaserWriter Pro 810 PostScript Fax Cartridge sells for $309. For more information on

continues



For an idea of how much color copier experience we have, push this 1.2 billion times.

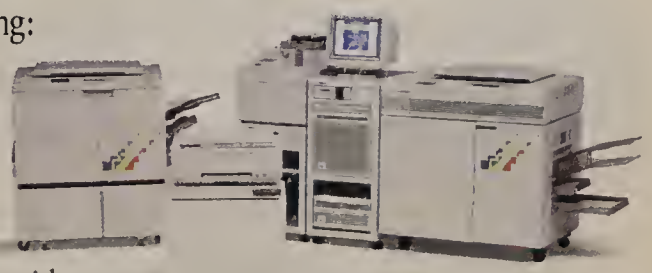
Since 1987, when Canon introduced the world's first Color Laser Copier, our copiers have made a whopping *one billion, two hundred million* color copies.



It's no wonder Canon has been the unsurpassed leader in color copiers for six consecutive years, with equally unsurpassed color quality.

Today, Canon makes the most technologically sophisticated color copiers available, including copiers that can even connect to your computer. And because different work environments have different needs, Canon offers a choice of color copier solutions. One sure to fit *your* needs.

So if you want the experience of Canon color copiers behind you, start pushing: 1-800-OK-CANON. We'll immediately rush you a free *Color Solutions* guide.



Official Copier of WorldCup USA 94™

Circle 110 on reader service card

Canon

SEE US AT MACWORLD EXPO BOOTH #1816

128 Megabytes To Go.



Chinon's New 3 1/2" Rewritable Optical Drive.

Now you can store 128 megabytes on a 3 1/2" disk. And take it anywhere. This technology is a massive breakthrough in mass storage.

In memory-hungry applications like desktop publishing, multimedia and CAD/CAM, the lack of portable, high-capacity storage has been a real limitation—until now.

Chinon's rewritable optical drives help you take full advantage of this exciting new technology. They offer the same rock-solid reliability and durable construction that has built Chinon's quality reputation. And their unique, proprietary dust protection system shields the drive mechanism, safeguarding your data for years to come.

Chinon optical drives are fast, too—with a 43ms access time, they're almost as fast as a hard drive. And the optical medium provides unsurpassed safety and data integrity.

External and internal versions are available for IBM and compatibles, external only for Macintosh. Best of all, Chinon optical drives are offered at a very competitive price.

Call Chinon today for the reseller nearest you. And get your data to go!

CHINON

The Drive To Succeed

Chinon America, Inc., 615 Hawaii Avenue, Torrance, CA 90503 Toll-free **(800) 441-0222** In California **(310) 533-0274**

IBM is a trademark of International Business Machines Corporation. Macintosh is a trademark of Apple Computer, Inc.

Circle 64 on reader service card

TRAY CHIC: PAPER-HANDLING OPTIONS

Here's an overview of special paper trays available for Apple's LaserWriter line; equivalent options are available for most third-party printers. Besides Apple, Hewlett-Packard, Texas Instruments, QMS, and Lexmark generally offer the widest array of paper-handling add-ons.

- For the LaserWriter Select 360, Apple offers the LaserWriter Select 250-Sheet Feeder w/Cassette ($149). Apple also offers the LaserWriter Select 30-Envelope Cassette ($89); the LaserWriter Select 250-Sheet Legal Cassette ($79); and the LaserWriter Select Multipurpose Tray Option ($25), which holds 50 sheets or 5 envelopes.
- The LaserWriter Pro 600 and 630 are complemented by the LaserWriter Pro 500-Sheet Feeder ($399) and the LaserWriter Pro Envelope Feeder ($399), which holds 75 envelopes.
- Apple's LaserWriter Pro 810 can shuffle paper better than a bureaucrat, boasting three 250-sheet trays as standard equipment. The optional LaserWriter Pro 810 Automated Media Feeder ($359) holds 15 envelopes or 100 sheets of transparency media or card stock.
- The now-discontinued Personal LaserWriter NTR had one 50-sheet multipurpose tray. Apple still sells the Personal LaserWriter 250-Sheet Cassette Base ($99) as well as the Personal LaserWriter Letter Cassette ($65), the Personal LaserWriter Legal Cassette ($65), and the Personal LaserWriter Envelope Cassette ($75).
- Datasource (404/451-0257, 800/676-3962) sells TowerFeed multibin add-ons for the LaserWriter Pro 600 series and the discontinued LaserWriter II line (the IINT, IINTX, IIf, and IIg). The TowerFeed 444 is available in several configurations: the Model 33 ($1995 for LaserWriter II's, $2195 for the LaserWriter Pro 600s) provides three 500-sheet trays; the Model 44 ($2395 for LaserWriter II's only) provides four trays; the floor-standing Model 75 ($3745 for LaserWriter II's, $3945 for the LaserWriter Pro 600s) provides five trays in addition to two storage drawers. All include enhanced driver software for switching between several trays and giving trays descriptive names such as "Letterhead" and "Rough Drafts." TowerFeed models are available for other brands of laser printers, and Datasource also sells less expensive devices for such tasks as feeding large quantities of envelopes or stacking printer output.

PostScript faxing, see last October's *Working Smart* column.)

Modifying LaserWriter 8

While exploring America Online, I found a utility that can perform several modifications to the LaserWriter 8 driver. Printer Defaults 1.1.1, a free utility created by John Rawnsley, can modify the driver to not print page borders in the two-up and four-up modes; to limit the maximum number of copies you (or people whose Macs you administer) can print; to add a two-up or four-up pop-up menu to the Print dialog box; to not require AppleTalk to be active (for generating print-to-disk files when you aren't connected to a network); and much more.

If you're comfortable working with Apple's ResEdit utility (version 2.1.1, $29.95 with documentation; APDA, Apple, 716/871-6555, 800/282-2732; free online and from most user groups), you can perform several more modifications, including adding the ability to print more than four thumbnails on a page. (This can be handy if you have an 11-by-17-inch printer.) You'll find instructions in a file named LaserWriter 8.x Hacks & Patches 1.1, created by Don Markuson. But don't modify your only copy of the driver. Make a duplicate and modify the copy instead—cheap insurance in case you do something to scramble it. Also, if you're in charge of a network, you might give all users a copy of the modified driver so that everyone has the same printing options.

You can locate Printer Defaults 1.1.1 or Don Markuson's modification instructions using America Online's file finder (search for the text *LaserWriter 8*). Or just visit the Macworld Online forum on America Online. If you use either of the files—or if you come up with additional tricks for LaserWriter 8—drop me an E-mail and share your experiences. My AOL address is JIMHEID; on CompuServe, I'm 76174,556. **m**

NEXT MONTH: Time Billing

Contributing editor JIM HEID is the author of *Macworld Complete Mac Handbook Plus CD* (IDG Books Worldwide, 1993). His newest book, *Macworld Word Companion Special Edition*, a hands-on guide to Microsoft Word 6, will be available when Word 6 ships.

SO MANY TYPEFACES SO LITTLE SPACE

Over 200 unique display typefaces. Call for a free brochure.

MACWORLD MW EDITORS' CHOICE

Fatfinger™
Fly™
Inscription™
Lightnin'™
Pristina™
SHAMAN™
TAG™

TYPE EMBELLISHMENTS™ THREE

For free brochure, demo disk, or questions call 1-800-TYPE or contact an authorized Letraset dealer.

ALL FONTEK PRODUCTS AVAILABLE ON CD ROM ONLY $99.95

FONTEK
DIGITAL FONTS FROM LETRASET®

Circle 255 on reader service card

June 14, 1963.
Cindy Smith plays with color.



Thirty years later her business
depends on it.



Introducing the QMS ColorScript Laser 1000. Now your business has total freedom of expression.

For Cindy, communicating decision-critical information quickly, flawlessly and in brilliant color is now her livelihood. That's why she depends on the QMS ColorScript® Laser 1000 Print System. It frees her to print entire forms and letterhead with color logos, images and high quality text without changing paper. It saves her the cost of stocking special forms, letterhead and multiple sets of supplies and uses standard paper and transparencies. It improves her message by highlighting key data with color in multipage presentations and documents. Add direct connection to a variety of networks and anyone can realize both greater productivity and a per user cost that rivals personal printers. Plus, our easy software loadable upgrades virtually eliminate obsolescence.



Save money. Save time. Free yourself from limitations. Discover the advantages of the QMS® ColorScript Laser 1000 Print System.

• Laser color and monochrome printing • Compatibility with PostScript™ Level 2 and Level 1, HP PCL®5C and HP-GL® • TrueType font scaling • Automatic collation • Simultaneous input and automatic emulation switching • 65 resident type fonts • EfiColor™ and Colorimetric color dictionaries and Apple ColorSync™ device profile • Supports DOS, Windows,™ Macintosh® and Unix® applications • Software loadable system upgrades

Expression is a serious business.
Call QMS today at 800 392-7559 or 205 633-4300
for the name of a reseller demonstrating
the QMS ColorScript Laser 1000 in your area.

QMS

Q-Fax 800 633-7213 • Canada 800 263-5508

Now being demonstrated at resellers in major cities in the U.S.

QMS, QMS ColorScript and the QMS logo are trademarks or registered trademarks of QMS, Inc. PostScript is a trademark of Adobe Systems Incorporated which may be registered in certain jurisdictions. All other product and company names mentioned are trademarks or registered trademarks of their respective companies.

InfoFAX

Please see page 199 for instructions.



BY LON POOLE

Quick Tips

Tips, Tricks, and Shortcuts

EVERYONE KNOWS HOW TO LOCK A FILE with the Finder's Get Info command, but how do you lock a folder? It's easy with System 7, says Marc Robinson of Philadelphia. Just select the folder you want to lock, choose Sharing from the Finder's File menu to bring up the folder's file-sharing privileges window, and in it check the box labeled "Can't be moved, renamed or deleted." You don't have to actually share the folder or change any other settings in the privileges window. For this trick to work, System 7's file sharing must be on; the Sharing command tells you to turn it on with the Sharing Setup control panel if necessary.

Sound Improvements

Q. How can I upgrade my Mac IIci to the same sound capabilities as the latest Mac models?

Frank A. Cuomo
Gadsen, Alabama

A. You can get the CD-quality audio input and output (stereo 16-bit sound sampled at 44.1kHz) that comes on the 660AV and 840AV as well as every Power Mac by installing the Pro Audio-Spectrum 16 Mac, a $495 NuBus card from Media Vision (510/770-8600 or 800/845-5870). An LC version is also available for $395. These products include a multisource analog mixer, a 20-voice stereo synthesizer, and MIDI input and output; no Mac's built-in audio has these features.

You can also improve the operating system's handling of sound by installing Sound Manager 3.0 (available from online services or as part of Apple's System Update 2.0.1 from the Apple Order Center, 800/769-2775, ext. 6717, for $10). Sound Manager 3.0 includes a system extension and a new Sound control panel. You must have System 7.0 with QuickTime, System 7.1, or a later version of system software. It works on all Macs except the classic-style hardware such as the Macintosh Plus, SE, and Classic.

Here's a rundown of Sound Manager 3.0's main improvements according to Apple: Sound Manager 3.0 is more efficient than previous versions and makes audio sampled at 11kHz sound much better. As a result, applications can play more sounds simultaneously and QuickTime movies sound better. With Sound Manager 3.0 installed, you can boost the volume of a QuickTime movie by pressing the option key while adjusting the volume



control in the QuickTime movie controller. On monophonic Macs like the LC, Sound Manager 3.0 blends the left and right channels of a stereo signal instead of playing only the left channel. A true square-wave tone generator lets you hear the Simple Beep alert sound the way it was designed to sound. You hear fewer clicks and pops in general, and other bugs have been fixed.

Disk-Space Wasters

Q. I copied a folder with 2134 alias files from one hard drive to another. The Get Info command shows that the size of the folder doubled from 2.7MB to 5.4MB, while the byte count remained the same (1,028,378 bytes). What gives?

George Kopeczky
Honolulu, Hawaii

A. Undoubtedly the folder size increased because the destination drive had a larger capacity than the source drive. The Mac file system allocates a minimum amount of disk space for each file regardless of its actual contents. The minimum file size for a particular disk is set when it is formatted (or when it is partitioned, if it has multiple partitions), and increases incrementally as disk (or partition) capacity increases. Most formatting programs set a minimum file size of 1K on disks with capacities of less than 64MB, 1.5K on disks with capacities of 64MB to 95MB, 2K on disks between 96MB and 127MB, and so on. Thus 2134 files would take at least 2.1MB (2134K) on a 40MB hard drive but 4.2MB (4268K) on a 120MB drive. Allocating disk space in smaller chunks than these would decrease hard drive performance.

The byte count doesn't change when you copy files because it measures the amount of space actually used, not the amount allocated. Typically an alias file uses less than the amount allocated even on a small hard drive; unfortunately the unused part of the allocated space is wasted. Your 2134 alias files, which use a total

continues

of about 1MB (1,048,576 bytes), waste 1.6MB on your smaller drive and 4.1MB on your larger drive. To reduce this kind of waste, use a disk-formatting program to partition your large drive, and then keep small files like aliases on partitions smaller than 64MB.

Avoiding Inverted Records

TIP 4th Dimension's Array to Selection command does not always work as you might expect. If you use the command to copy an array to an empty file (a file that has no records), the records created contain an upside-down image of the array; that is, the first record contains the value of the last array element, and so on. This behavior is undocumented. You can get around it with a 4D procedure that first creates a number of blank records equal to the number of elements in the array (using a For loop and the Size of Array function); then selects all records in the file (using the All Records command); and finally copies the array elements, in order, to the newly created blank records (using the Array to Selection command). Alternatively, you can simply reverse-sort the array before executing the Array to Selection command. This works only if the array is already sorted and you don't mind changing the order of the array.

Kahlid Gomaa
Cairo, Egypt

While these methods may work for you, ACI US technical support warns that record order is never guaranteed in 4th Dimension, and record order is especially vague if you've deleted records to make a file empty, because 4D tries to reuse the space once occupied by deleted records. The only reliable way to arrange records in a particular order is to sort them. To achieve your goal, you would save the value of an array element in one field of each record and the corresponding index number of the array element in a separate sort-key field. Then you could sort the file by that sort-key field to arrange the records in the same order they had in the array.—L.P.

Rotating Oblong Images

TIP If you open a horizontal image in Fractal Design Painter 2.0a (with or without Painter/X2) and then rotate the whole image to a vertical orientation, Painter crops the now-vertical image to fit the original horizontal image area. This cuts off a lot of image! By following these steps you can get a perfectly rotated vertical image:

1. Open the image, check its dimensions with the Resize command, and note its horizontal dimension.

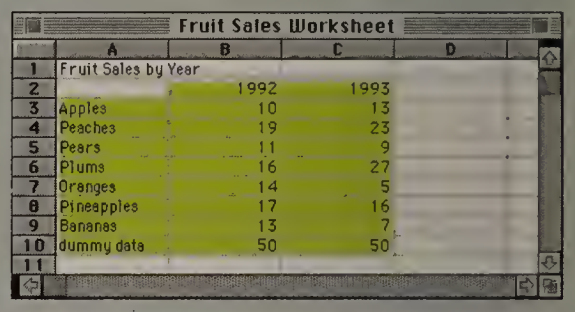
2. Open a new square document with dimensions slightly larger than the hori-

continues

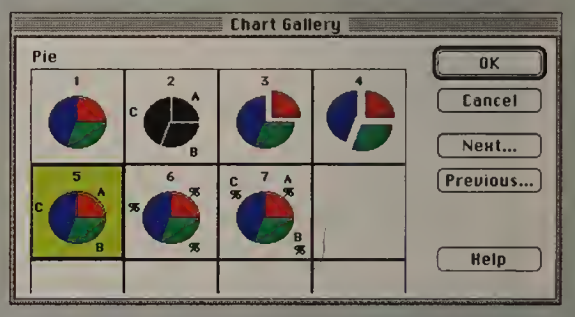
IMPOSSIBLE PIE

Once in a while in Microsoft Excel you may need a multiple pie chart of the type shown here. You could create two charts, copy them to a draw program, and assemble a composite there, but Shane Devenshire of Walnut Creek, California, has devised a trick for creating the compound chart in one chart document.

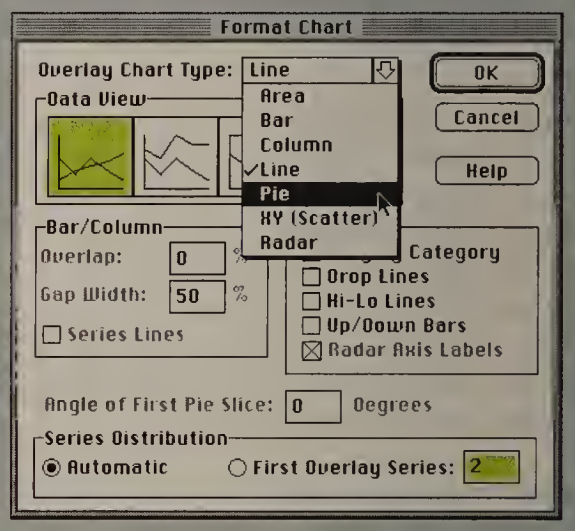
1. Start by entering two columns of data and including an extra row with dummy data whose values are much larger than the other entries. Then select the data and use the New command to create a new chart document.



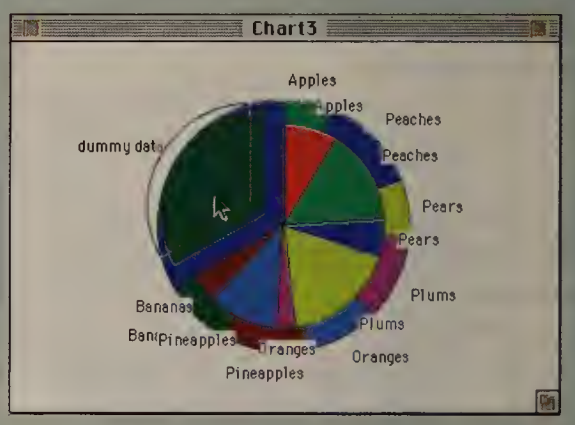
2. Choose Pie from the Gallery menu, and in the dialog box that appears double-click pie chart style 5. This creates a pie chart for your first column of data, with each pie slice labeled.



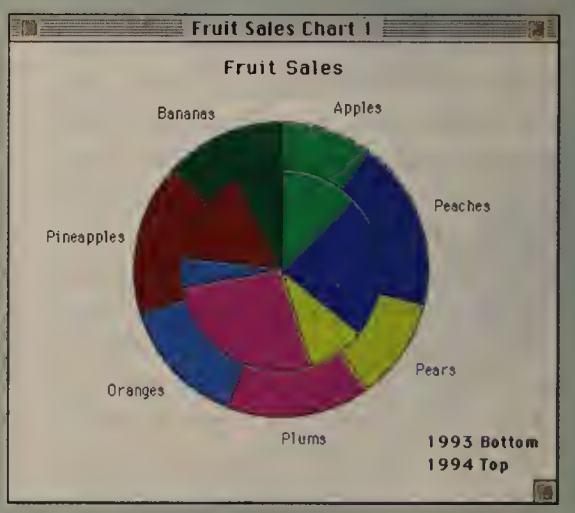
3. Choose Add Overlay from the Chart menu, creating a line-type overlay chart for the second column of data. To change the overlay to a pie chart, choose Overlay from the Format menu. In the dialog box that appears, choose Pie from the Overlay Chart Type pop-up menu and click OK.



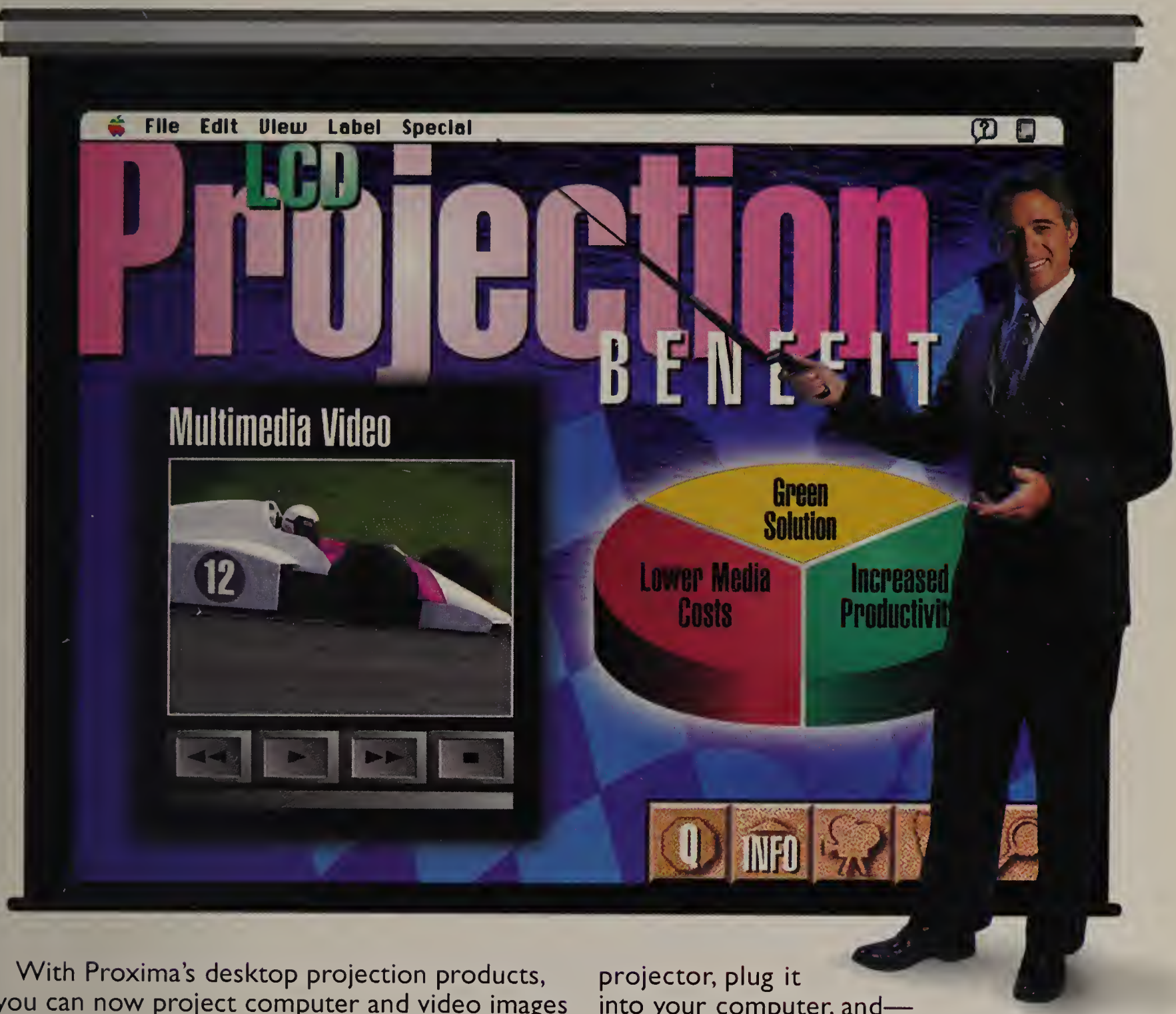
4. Select the dummy data pie slice from the overlay pie and drag it away from the pie center. This shrinks the overlay pie, revealing the main pie underneath. You can shrink the top pie more by dragging the slice farther out, or enlarge the top pie by dragging the slice closer to the center.



5. Remove the dummy slices from both pies by switching to the spreadsheet window and clearing the dummy data row. Switch back to the chart window and change the pie-slice colors on the overlay chart to match the colors on the main chart. (To change a slice's color, double-click the slice to bring up the Patterns dialog box, and there choose a color from the Foreground pop-up to match the slice for the same data category in the main chart.) Remove the slice labels on the overlay chart, which duplicate the labels on the main chart, by selecting each label in turn and using the Clear command. Finally add a chart title with the Attach Text command, and add a legend as unattached text.



Introducing Proxima's Portable 10-Foot Monitors



With Proxima's desktop projection products, you can now project computer and video images as large as 25 feet! And that means you can take advantage of the productivity-enhancing power of your personal computer to make your presentations, business meetings, training, and interactive workgroup sessions more effective.

Simply connect a Proxima Desktop Projector™ to your PC or Mac and instantly deliver dynamic color graphics...crisp data... brilliant video. Or place one of our LCD projection panels on an overhead projector, plug it into your computer, and—presto!—the benefits of the giant screen are yours.



From our MultiMode® and active-matrix Ovation™ projection panels to our dazzling new Desktop Projectors and our remarkable Cyclops® cordless-mouse pointer, Proxima has created a whole new way to showcase your ideas and imagination—starting at less than $1,600!

So call us for more information.

PROXIMA®

PROJECTING THE POWER OF YOUR COMPUTER IN THE MEETING ROOM.℠

CALL NOW TOLL-FREE

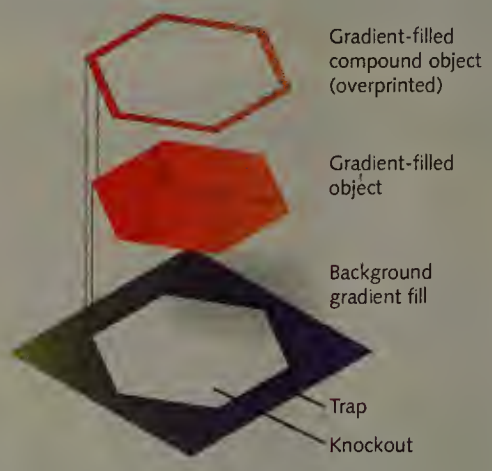
1-800-447-7694

Proxima Corporation 9440 Carroll Park Drive, San Diego, CA 92121-2298, (619) 457-5500. In Europe, Horsterweg 24, 6191 RX Beek, The Netherlands, +31-43-650 248. Proxima, MultiMode, and Cyclops are registered trademarks and Ovation, Desktop Projector, and Desktop Projection are trademarks of Proxima Corporation. Other trademarks are the property of their respective owners.

Circle 47 on reader service card

TRAPPING WITH GRADIENTS

Although Adobe Illustrator 5.0's Paint Style dialog box doesn't allow you to paint a stroked path with a gradient for creating a trap, Evan Goldstein of Wantagh, New York, has devised an easy workaround. The following steps illustrate the method, with a hexagon that is filled with a red-to-yellow gradient on a rectangular background that is filled with a green-to-purple gradient. This method works with other objects (including type you have converted to outlines) and any combination of gradients.



1. Create a rectangle and fill it with a green-to-purple gradient. Then create a hexagon on top of it, fill it with a red-to-yellow gradient, and stroke it with a solid line for the trap (as always, the stroke should be twice the thickness of the trap).

2. Select the hexagon and choose Outline Stroked Path from the Objects submenu of the Filter menu. This filter removes the hexagon's original stroke and creates a new compound path that precisely outlines the hexagon's original stroke. You may find it helpful to enlarge the view so you can clearly see the new compound path. To understand what the filter created, use the selection tool in preview mode to drag the compound path out of position temporarily. Then undo to move the compound path back into position. This compound path will be the overprinting stroke for the hexagon.

3. Select the original hexagon and make sure it is not set to overprint. Then select the compound path, which can be filled as an object, and fill it with the same red-to-yellow gradient as the hexagon. Set the compound path's fill to overprint. Now the edges of the original hexagon are covered by a compound path that extends into the green-to-purple background and overprints to act as a spread.

In this example, the object is lighter than the background. If the background in your drawing is lighter than the object, fill the trap with the same gradient as the background. If you want to change the direction of the gradient, make sure to first select both the object and the compound path so that the trap's fill matches the object's fill. It's easier to select an individual object—the compound path, the object it traps, or the backdrop object—if you put them in separate layers. This is especially helpful if you want to use the gradient tool to change the angle of the gradient.



This PowerBook May Be

STOLEN!

Please call police or 310/555-1212 if anyone besides King Stone (owner, pictured at left) is in possession of this PowerBook.

Authorized Carriers A start-up screen like this won't keep someone from walking off with your momentarily unattended PowerBook, but just imagine the scene at the pawn shop.

zontal dimension of the original image.

3. Copy the image from the original document and paste it into the square document.

4. Rotate the selection to a vertical orientation, copy it, and then use the Paste into New Picture command to create a new document with the image vertically oriented.

John Allison
Vancouver, British Columbia, Canada

Theft Recovery Aid

TIP PowerBook owners, a custom start-up screen can help you recover your computer if it is ever stolen. Just create a PICT file containing the text "THIS POWERBOOK IS STOLEN! Please call police or owner: 310/555-1212" and save the file in your PowerBook's System Folder in start-up screen format. Better yet, include digitized photos and vital statistics of yourself and other persons authorized to have the PowerBook (see "Authorized Carriers"). For even more security, use ResEdit or some other file-utility software to make the Startup Screen file invisible. Even a thief who knows where to look for a start-up graphic will conclude you burned it into ROM.

Kevin McKeown
Santa Monica, California

Many programs can save PICT files in start-up screen format, including Deneba's Canvas 3.0, Capture Viewer (bundled with Mainstay's Capture 4.0), Adobe Photoshop (all versions), and Deneba's UltraPaint 1.03.

Utility software such as Connectix PowerBook Utilities, Norton Essentials for PowerBook, and VST Systems' PBTools can be set to require entering a password before allowing your PowerBook to wake up or start up, but these passwords are easily bypassed by starting up with a floppy disk. Disk-locking software such as SafeLock (Trend Micro Devices, 310/782-8190, 800/228-5651) as well as the disk-locking options of many hard drive formatting programs prevent bypassing the password. For more information on PowerBook security, see *PowerBook Notes,* June 1993.—L.P.

ZTerm Menu Separator

TIP You can create a separator line in ZTerm 0.9's Dial menu by creating a new entry in the dial directory with a hyphen as the name. This is useful for me since I access two sets of BBS numbers, each set in a different area code: one from my home town and one where I attend school. I make an entry appear above the separator line by prefixing its name with a space, and I do nothing special to entries I want to appear below the separator. ZTerm evidently alphabetizes its Dial menu by the numeric codes that the computer uses to internally represent text, and a space has a lower code than a dash, which has a lower code than numbers and the letters of the alphabet.

Matt Brown
Columbia, Missouri

This tip is not mentioned in the ZTerm documentation, but is described in the ZTerm 0.9 FAQ by Leslie Jones. This document answers frequently asked questions (FAQs) about ZTerm and includes undocumented tips, ResEdit hacks, bug reports, and bug-fixes. It is always available electronically on America Online and numerous Internet FTP sites, and it is usually available on other commercial online services as well.—L.P. **m**

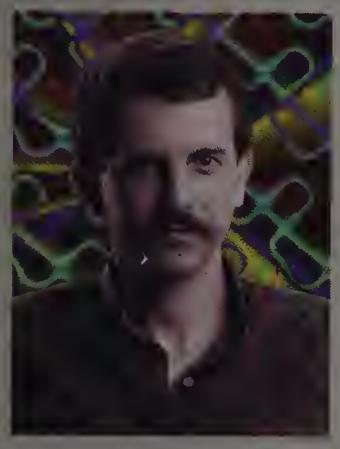
We pay from $25 to $100 for tips published here. Send questions or tips on how to use Mac computers, peripherals, or software (by mail or electronically) to *Quick Tips,* Lon Poole, at the address listed in *How to Contact Macworld* at the front of the magazine (include your address and phone number). All published submissions become the property of *Macworld.* Due to the high volume of mail received, we're unable to provide personal responses.

LON POOLE answers readers' questions and selects reader-submitted tips for this monthly column. His latest book is *Macworld Guide to System 7.1, 2nd Edition* (IDG Books Worldwide, 1993).

Kai's Power Tools™ 2.0

Divine the Future of Imaging

Thirty-three fantastic filters and extensions for Photoshop, Painter, Canvas, PixelPaint, PhotoFlash and others that accept plug-ins. Radiant gradients. Gorgeous textures. Awesome fractals. As the highest rated program ever reviewed in MacWeek, Kai's Power Tools is unmatched. And now it's a standalone solution because it includes Color-It!, Micro Frontier's award-winning 32-bit image processing paint program—FREE!



"KPT is not only great for dazzling special effects, but it provides a wealth of tools for the nuts and bolts work we all do every day."

Lee Varis
Digital Artist



MACWORLD MW ★★★★★



"The Hermit" © 1993 Lee Varis. Used with permission.

About the Image. Renowned digital artist/photographer Lee Varis of Los Angeles, Calif. filled in the world of "The Hermit", one in his series of haunting tarot card images, using Kai's Power Tools. KPT's Gradient Designer produced the glowing orb and its cascading rays, KPT Texture Explorer created the card's border, while the KPT Sharpen Intensity filter brought out details in the rock. To build the dream-like landscape on the horizon, Varis used a beta version of the awesome KPT New World Explorer™ (codename "Bryce"), a powerful natural and supernatural 3-D landscape creation program—coming soon from HSC Software.

MacWEEK ◆◆◆◆◆

MacUser ★★★★★

NewMedia Magazine Awesome

★★★★ Publish

HSC SOFTWARE

© 1994 HSC Software Corp. Kai's Power Tools and KPT New World Explorer are trademarks of HSC Software Corp.
All other product names are trademarks or registered trademarks of their respective owners.

Circle 5 on reader service card

MACWORLD EXPO

PowerPC 620

MOTOROLA

©'94 Lois & Bob Schlowsky

WHERE IT ALL COMES INTO VIEW

A WORLD OF OPPORTUNITY

How can you maximize the potential of the Macintosh? See the latest and best Macintosh products and services? Learn how best to put the Macintosh to work for you? Discover all this and more at MACWORLD Expo.

With over 400 exhibiting companies presenting the latest in Macintosh technology, MACWORLD Expo is the single best resource for learning how to harness the power of the Macintosh. Visit exhibits from the leading Macintosh vendors. Make practical decisions on how to configure your Macintosh system to meet your business or personal needs. Envision tomorrow's technology, under development today. At MACWORLD Expo, the world of Macintosh all comes into view.

Discover the Creative Possibilities

At MACWORLD Expo, make side by side comparisons of thousands of Macintosh hardware, software, peripheral and service products. Have a question? Need an expert opinion? Our on-site Macintosh professionals lend their expertise to help you choose the best products for your individual needs. We'll help you take your Macintosh to the max!

MACWORLD Expo/Boston; August 2-5, 1994

MACWORLD Expo/Boston will cover over 350,000 square feet of exhibit space at both the World Trade Center and Bayside Exposition Center. When you come to MACWORLD Expo/Boston, you'll see uses and applications for the Macintosh in a variety of areas including: Networking, Spreadsheet Analysis, Databases, Education, Research, Word Processing, Accounting, Law, CAD/CAM, Forecasting, Design, Publishing, Illustration, Animation, Music, Programming, Entertainment and Multimedia. You'll see all this spread out over both locations so plan to be in Boston from August 2-5 and experience the Macintosh at its absolute best!

DON'T MISS THE UGWUMP!

User Group Welcoming Unwinding Meeting Place

"People Networking parlor" For user groups to share success stories, exchange newsletters and literature. Learn how to start a user group in your area!

Pre-Registration Savings!

Now is the time to pre-register for MACWORLD Expo. Return the attached pre-registration form with your payment by June 24 and save $30 on all Conference sessions and Exhibits ($120 now vs. $150 at the door). An Exhibits-only admission saves you $15 ($25 now vs. $40 cash only at the door). And since your time is as valuable as your money, we'll send your admission badge early when you pre-register. Avoid the registration crowds and get a jump start on the exhibition!

THE CONFERENCE PROGRAM

Tomorrow's Innovations Today

MACWORLD EXPO/BOSTON 1994 CELEBRATES THE 10TH ANNIVERSARY OF THE MAC'S DEBUT WITH A PANORAMA OF EMPOWERING OPPORTUNITIES AND POSSIBILITIES. FROM APPLE'S TECHNOLOGICAL BREAKTHROUGHS TO THE IMPACT OF DIGITAL CONVERGENCE, YOU'LL DISCOVER NEW DIMENSIONS TO THE MAC.

HERE'S A PREVIEW OF MACWORLD EXPO/BOSTON'S 14 SEPARATE CONFERENCE PROGRAMS. CREATE YOUR OWN AGENDA:

1 The PowerPC Conference.

EVERYTHING THERE IS TO KNOW ABOUT POWERPC — FOR USERS, VENDORS, AND DEVELOPERS — INCLUDING: WHAT POWERPC DELIVERS; APPLE'S IMPLEMENTATION VS. IBM'S; COMPATIBILITY; UPGRADING; WHEN/WHAT TO BUY; NATIVE VS. EMULATION; HOW COMPETITIVE IS POWER PC?; POWERPC DEVELOPMENT TOOLS; AND MORE.

2 The Design Conference.

CELEBRATED MAC DESIGNERS SHARE CREATIVE INSIGHTS AND POWER-USER TIPS ON: COLOR MANAGEMENT; CREATIVE IMAGING; PREPRESS; DIGITAL PHOTOGRAPHY; MIXING MEDIA; DIGITAL ART; KPT; AND MORE.

3 The Entertainment Conference.

THE BEST IN THE BUSINESS PRESENT TOOLS AND TECHNIQUES FOR TV, FILMS, AND COMMERCIAL APPLICATIONS, FEATURING: INTERACTIVE CINEMA; QUICKTIME MOVIES; DIGITAL VIDEO; HIGH-END MUSIC; INNOVATIVE EFFECTS; INTERACTIVE EROTICA; LIVE THEATRE; AND BROADCAST QUALITY GRAPHICS.

4 The Connectivity Conference.

ENHANCE COMMUNICATIONS, MAXIMIZE NETWORKS, AND SEE WHAT'S IN STORE FOR THE FUTURE WITH: CONNECT-ANYWHERE NETWORKING; MAXIMIZING THE INTERNET; NETWORKING NEWTONS; TCP/IP; CLIENT/SERVER; NETWORK MANAGEMENT TOOLS; APPLETALK NETWORKING.

5 The Small Office/Home Office Conference.

YOUR NEEDS ARE DIFFERENT THAN GIANT ORGANIZATIONS! SPECIAL SOHO TIPS ON MARKETING, TELECOMMUTING, FINANCE/ADMINISTRATION.

6 The Science/Technology Conference.

THE MAC AS A CRITICAL TOOL IN LABORATORY AND SCIENTIFIC SETTINGS, INCLUDING TIPS ON VISUALIZATION USING QUICKTIME, SCIENTIFIC DATA ANALYSIS, AND VIRTUAL REALITY.

7 The Programmer/Developer Conference.

FOR IN-HOUSE DEVELOPERS, VETERAN INDEPENDENTS, AND NOVICE MAC TECHIES ALIKE: THE NEW WORLD OF OPPORTUNITIES WITH NEWTON, POWERPC, OPENDOC, APPLESCRIPT — PLUS ULTIMATE MAC PROGRAMMING TIPS.

8 The Education Conference.

TEACHERS AT THE ELEMENTARY, SECONDARY, AND UNIVERSITY LEVELS SHARE SUCCESSFUL MAC EXPERIENCES WITH MULTIMEDIA, CD-ROM, HYPERCARD, QUICKTIME, BBSS, INTERNET — AND STUDENTS DEMO THEIR MOST OUTSTANDING MAC PROJECTS IN SCIENCE, MATH, SOCIAL STUDIES AND DESKTOP PUBLISHING.

9 The How-to-Get-Started Conference.

LEARN THE BASICS — OF NEWTON, DESKTOP PUBLISHING, MUSIC, INTERNET, TELECOMMUNICATIONS, DESIGN, MULTIMEDIA, QUICKTIME, AUTHORING, INTERACTIVITY, AND USING CD-ROM.

10 The Advanced User Conference.

VETERAN USERS SHARE THEIR EXPERTISE ON CUSTOMIZING YOUR MAC, RESOLVING SYSTEM CONFLICTS, MAXIMIZING FONTS, AND POWERIZING YOUR POWERBOOK.

11 The Special Interest Group Conference.

LOOKING TO COMPARE MAC NOTES WITH OTHERS? DEVELOP AN INVALUABLE "USER NETWORK." HERE YOU'LL FIND SESSIONS ON THE MAC IN THE LAW OFFICE, HEALTH CARE, REAL ESTATE, AND IS; AND THE PERENNIAL FAVORITE MUSE (MACWORLD EXPO USER GROUP EXTRAVAGANZA).

12 Application Workshops.

INTENSIVE TRAINING SESSIONS BY MACACADEMY ON: BEGINNING MACINTOSH; ADVANCED MACINTOSH; MACINTOSH FONTS; BEGINNING MAC NETWORKING; CLARIS FILEMAKER PRO; MICROSOFT WORD; ALDUS PAGEMAKER; MICROSOFT EXCEL.

13 The Multimedia Conference.

CREATE QUALITY PRODUCTIONS AND PRESENTATIONS WITH BOTH HIGH-END AND LOW-END MULTIMEDIA TOOLS. SHARE INSIGHTS FROM THE WORLD'S MOST SUCCESSFUL MULTIMEDIA EXPERTS ON INTERACTIVITY, DESKTOP VIDEO, ANIMATION, INTERFACE DESIGN, AUTHORING TOOLS — AND SEE THE PROFITABLE IMPACT IN EDUCATION, TRAINING, AND MUSEUMS.

14 The CD-ROM Conference.

WANT TO PUBLISH AN ENTERTAINMENT OR CONSUMER CD? START WITH THE MAC. LEARN ABOUT PHOTO CD; KIOSKS; BUILDING SUCCESSFUL TITLES; DEVELOPING INTERACTIVE GAMES; CONTENT LICENSING; DOCUMENT CONVERSION AND MANAGEMENT; AND MARKETING YOUR CD.

MACWORLD EXPO/BOSTON

BAYSIDE EXPOSITION CENTER & WORLD TRADE CENTER

EXHIBITION HOURS

AUGUST 2-4	10:00AM-6:00PM
AUGUST 5	10:00AM-4:00PM

CONFERENCE HOURS

AUGUST 2	10:30AM-5:30PM
AUGUST 3-4	11:30AM-5:30PM
AUGUST 5	11:30AM-2:30PM

PRE-REGISTER FOR MACWORLD EXPO/BOSTON BY JUNE 24, AND SAVE $15 TO $30

PLEASE REGISTER ME FOR:

❑ **PACKAGE ONE $120.**
CONFERENCE SESSIONS* AND EXHIBITS.
PREREGISTER BY JUNE 24
($150 AT THE DOOR).

❑ **PACKAGE TWO $25.**
ADMISSION TO EXHIBITS ONLY. PRE-REGISTER BY JUNE 24 ($40 CASH ONLY AT THE DOOR).

❑ **CHECK IF APPLICABLE.**
I'M AN INTERNATIONAL ATTENDEE. PLEASE SHIP MY BADGE BY FEDERAL EXPRESS.
ENCLOSED IS AN ADDITIONAL $45.

PLEASE CHOOSE YOUR PACKAGE AND FILL OUT THE FORM COMPLETELY. INCOMPLETE FORMS WILL BE RETURNED. ONE FORM PER PERSON; MAKE PHOTOCOPIES FOR ADDITIONAL PEOPLE. PLEASE DO NOT STAPLE CHECK TO FORM. REGISTRATION FORMS RECEIVED AFTER JUNE 24, WILL BE RETURNED UNPROCESSED. PURCHASE ORDERS CANNOT BE ACCEPTED. ALL REGISTRATION FEES ARE NONREFUNDABLE. A $20 FEE WILL BE CHARGED FOR ALL RETURNED CHECKS. SEND COMPLETED FORMS TO:

MACWORLD EXPO/BOSTON
P.O. BOX 4010
DEDHAM, MA 02027

U.S BADGES: MAILED AROUND JULY 18.

INTERNATIONAL BADGES: HELD ON-SITE.

BADGE PICKUP HOURS ARE:
AUG. 1, 11AM - 3PM; AUG. 2-4, 9AM - 6PM; AUG. 5, 9AM-4PM

PLEASE SEND MY REGISTRATION BADGE AND FURTHER INFORMATION TO:

PLEASE CHECK ONE: ❑ HOME ADDRESS ❑ COMPANY ADDRESS

FIRST NAME ___/___/___/

ATTENDING MADE EASY

MACWORLD Expo/Boston 1994, Bayside Exposition Center, 200 Mount Vernon Street and World Trade Center, 164 Northern Avenue.

Tuesday, August 2 – Thursday, August 4, 10:00 a.m. - 6:00 p.m. and Friday, August 5, 10:00 a.m. - 4:00 p.m.

U.S. Attendees.

Badges will be mailed on or about July 18. Be sure to check box indicating where badge should be sent.

International Attendees.

International badges (including Canadian) will be held for pick-up at the International Preregistration counter at Bayside Expo Center. For Federal Express service, check the appropriate box below and add $45 to your preregistration fee. Fill in your exact street address (no P.O. boxes) and include your telephone number and country code. We will Federal Express your badge directly to you. Badge Pickup hours are: Aug. 1, 11am - 3pm; Aug. 2-4, 9am - 6pm; Aug. 5, 9am-4pm

Fly American Airlines and Save.

Enjoy savings on applicable fares when you fly American Airlines, the official airline of MACWORLD Expo. American is offering attendees discounts of 5-10% on most fares. Dial 800-433-1790 to speak with an American Airlines reservationist and reference Star File #S017AL. Savings are available on applicable fares only.

Car Rental Discounts From Alamo.

Alamo Rent a Car has been appointed the official car rental company for MACWORLD Expo/Boston, and special discounted rates have been extended to attendees. These rates are available one week before and after the meeting dates and include unlimited free mileage. To make reservations call Alamo at 1-800-732-3232 and request group i.d. #378360 and rate code GR. Advance reservations are required.

SAVE UP TO $30 RE-REGISTER BY JUNE 24!
AVE $15 – $30 ON YOUR EXPO CKAGE WHEN YOU PRE-REGISTER BY JUNE 24. WE'LL SENO YOUR BADGE EARLY TO HELP AVOID THE CROWDS.

Hotel Accommodations

Participating hotels in the Boston area are offering MACWORLD Expo discounts. To receive the preferred rate, call one of the hotels listed below and mention you'll be attending MACWORLD Expo. There are a limited number of rooms available and they sell-out quickly. Make your reservations by June 20 for the best selections. Prices reflect single and double occupancy. If you are reserving 10 or more rooms, you must supply the hotel with a rooming list and a non-refundable deposit for the first night, no later than June 20.

Services for the Physically Challenged.

We're committed to ensuring that our physically challenged attendees receive all the services they need to make their show visit enjoyable. Call us at 800-945-3313 for details.

Pre-recorded Information.

For pre-recorded information about MACWORLD Expo/Boston, call the MACWORLD Expo Information Hotline at 617-361-3941. 24-hours per day, seven days a week.

Early Bird Registration.

Missed the pre-registration date? You can still register before the start of the show! On-site Early Bird Registration is from 11:00 a.m. - 3:00 p.m. on August 1 at the full registration rates of $150 for all Conference Sessions and Exhibits, and $40 (cash only at the door) for Exhibits-only admission.

MACWORLD EXPOSITION

Hotel	Shuttle	Single/Double	Telephone
57 Park Plaza 200 Stuart St., Boston, MA 02116	B/C	$115/$125	(617) 482-1800
Back Bay Hilton 40 Dalton St., Boston, MA 02115	C	$150/$170	(617) 236-1100
Boston Marriott Copley 110 Huntington Ave., Boston, MA 02116	C	$179/$179	(617) 236-5800
Boston Marriott Long Wharf 296 State St., Boston, MA 02109		$230/$250	(617) 227-0800
Boston Park Plaza 64 Arlington St., Boston, MA 02116	B/C	$131/$151	(617) 426-2000
Colonnade Hotel 120 Huntington Ave., Boston, MA 02116	C	$170/$190	(617) 424-7000
Copley Plaza 138 St. James Ave., Boston, MA 02116	C	$179/$199	(617) 267-5300
Four Seasons 200 Boylston St., Boston, MA 02116	B/C	$242/$264	(617) 338-4400
Guest Quarters Hotel 400 Soldiers Field Rd., Boston, MA 02134	H	$155/$165	(617) 783-0090
Harborside Hyatt 101 Harborside Dr., Boston, MA 02128	H	$175/$195	(617) 568-1234
Hilton at Dedham Place 95 Dedham Place, Dedham, MA 02026	H	$125/$125	(617) 329-7900
Holiday Inn Government Center 5 Blossom St., Boston, MA 02114	B	$149/$165	(617) 742-7630
Hyatt Regency Cambridge 575 Memorial Drive, Cambridge, MA 02139	H	$165/$185	(617) 492-1234
Le Meridien Hotel 250 Franklin St., Boston, MA 02110	B	$210/$210	(617) 451-1900
Lenox Hotel 710 Boylston St., Boston, MA 02116	C	$150/$170	(617) 536-5300
Logan Airport Hilton Logan International Airport, E. Boston, MA 02128		$140/$160	(617) 569-9300
Omni Parker House 60 School St., Boston, MA 02108	B	$145/$165	(617) 227-8600
Ritz-Carlton Hotel 15 Arlington St., Boston, MA 02117	B/C	$210/$220	(617) 536-5700
Royal Sonesta 5 Cambridge Pkwy, Cambridge, MA 02142		$145/$145	(617) 491-3600
Sheraton Boston Hotel & Towers 39 Dalton St., Boston, MA 02199	C	$155/$170	(617) 236-2000
Sheraton Tara Braintree 37 Forbes Rd., Braintree, MA 02184	H	$119/$119	(617) 848-0600
South Bay Hotel *(Formerly Howard Johnson's)* 5 Howard Johnson Pl., Boston, MA 02125	H	$80/$90	(617) 288-3030
Swissotel One Ave. de Lafayette, Boston, MA 02111	B	$159/$169	(617) 451-2600
Tremont House 275 Tremont St., Boston, MA 02116	B	$110/$125	(617) 426-1400
Westin Copley 10 Huntington Ave., Boston, MA 02116	C	$185/$205	(617) 262-9600

*Legend: (B) Hotel is within walking distance of Boston Common shuttle location.
(C) Hotel is within walking distance of Copley Square shuttle location.
(H) Hotel is providing its own shuttle to MACWORLD Expo.

EDITED BY ELIZABETH DOUGHERTY

Networks

THE LATEST IN CONNECTIVITY AND COMMUNICATIONS

Global Village Introduces Fax and ARA Servers

GLOBAL VILLAGE COMMUNICATION, the maker of popular modems for the Macintosh, has taken the plunge into network hardware with its new OneWorld line of servers. The first two products, due to ship April 4, are the look-alike OneWorld Remote Access ARA server and the OneWorld Fax server.

The OneWorld Remote Access ships with either one or two internal V.32terbo (19.2-Kbps) PowerPort Mercury modems and 1MB of RAM, with room for up to 9MB of RAM using 32-pin SIMMs. It can connect to either a LocalTalk or a 10BaseT network. The server supports Apple Remote Access (ARA) 2.0, taking advantage of the security enhancements provided for by Apple, but ARA 1.0 clients can also dial in.

The OneWorld Remote Access will cost $1199 for LocalTalk and one modem, $1899 for Ethernet and two modems. The ARA client software must be purchased from Apple. The OneWorld Fax ships with one or two PowerPort Bronze 9600-bps fax modems.

The fax server sets up quickly and supports queuing and priority faxing. The GlobalFax for OneWorld software, which closely resembles the fax software bundled with the company's modems, graphically displays the fax queue and can play digitized audio of the call in progress. The software can also arbitrate between the fax server and an internal or external Global Village modem, so there's no need to open the Chooser each time you connect to or disconnect from the network.

The OneWorld Fax will list for $999 with LocalTalk and one modem. The two-modem Ethernet model will list for $1499. Both will include a license for 30 clients. Ten more users will cost $249; 50 more, $999. A site license will cost $3999.

Global Village's OneWorld Manager software manages all linked OneWorld servers. The administrator stores user and group information on individual servers in their flash ROM; OneWorld Manager downloads the information and uploads any changes the administrator makes. OneWorld Manager also displays current server activity in a window and maintains a running record based on logs kept by the individual servers. OneWorld Manager issues each user a "passport," which controls the user's access to all OneWorld servers on the network. The software can also import and export AppleShare and Shiva Net Manager users and groups.

Global Village has already announced upgrade plans for the new servers. These plans include adding dial-out capability to the OneWorld Remote Access by the end of this year, adding four- and eight-port models, and taking both products cross-platform. Global Village, 415/390-8200, 800/736-4821.—CAMERON CROTTY



KEVIN CANDLAND

Global Village Communication's OneWorld Fax and OneWorld Remote Access servers appear to be identical, but they contain different modems.

Restarting Macs by Phone

FRUSTRATED BY TRYING TO DIAL into a crashed or shut-down Apple Remote Access server Mac? Mac Power On/Off + Aux ($199.95), from Server Technology, is designed to solve both problems.

Made up of two compact hardware devices and a system extension, the package can activate a Mac when remote users dial into it, shut it down after they log off, and remotely restart a crashed Mac.

The cigarette-pack–size Intelligent Power Module (IPM) acts as an intermediary between the wall outlet and the Mac. The IPM connects with phone wire to the Mac Power On/Off unit, which also connects to the Mac's modem using standard RJ-15 telephone jacks.

If the Mac is turned off when a remote user dials in, the Mac Power On/Off unit detects the ring of the incoming call and signals the IPM to turn on the juice and then power up the Mac, booting it up (the communications program on the awaiting Mac must also be set to start up automatically). A system extension monitors the serial port and issues a shutdown command after a specified period of inactivity. The IPM shuts off the power a few minutes later, which turns off compact Macs that don't power down from the shutdown command.

To reboot a crashed Mac, you call in once to turn it off, and again to restart it.

For computers that share a phone line, Mac On/Off + Aux offers a second, pass-through RJ-15 telephone port to which you can connect a telephone, an answering machine, or a fax machine. Server Technology, 408/745-0300, 800/835-1515.—MARGIE WYLIE

Comm Toolbox Helper

THANKS TO THE EFFORTS OF THE small Russian software developer Stalker Software, Apple's Communication ToolBox (CTB) can finally work as advertised. With Stalker's PortConnector for Macintosh control panel ($49), any application that can use a modem can now use System 7's CTB Connection Tools to run protocols such as TCP/IP, X.25, and even ISDN.

The CTB in System 7 was supposed to make it possible for any communications program to use any connection method. Developers would write their software to work with CTB, other developers would write drop-in Connection Tools that supported different protocols, and all applications could communicate any way they pleased. It didn't work that way. Many applications (including Apple Remote Access) still don't support the Connection Tools capability.

The PortConnector enables any communications program—such as ARA, terminal emulators, and electronic bulletin board systems—to connect using any method for which you have a CTB Connection Tool. Third parties are currently shipping Connection Tools for ISDN, TCP/IP, and X.25. PortConnector works by creating virtual serial ports that accept data and respond to the programs as a modem would. Behind the scenes, the software translates commands and sends data through a CTB Connection Tool. For example, if you have the correct CTB Connection Tool and a copy of PortConnector running on both client and server machines, you could run ARA over TCP/IP, X.25, or ISDN, and the program would never know the difference.

PortConnector can also help CTB-compliant applications nest one connection method within another—for example, using one Connection Tool to reach a terminal server and another to control the modem as though it were connected locally. Stalker Software, 415/927-1026, 800/262-4722.—MARGIE WYLIE

Portable LocalTalk for PCs

MOST LOCALTALK ADAPTERS FOR Windows and DOS PCs require you to open the PC's case and install the card in a free expansion slot, which some PCs either can't spare or, in the case of portables, don't have. Apexx Technology's handy external adapter lets you install LocalTalk in even portable PCs without cracking a case. About the size of a pack of playing cards, Apexx's PCTalk adapter ($199) snaps into a PC's parallel port. The adapter requires more power than the parallel port offers, however. The adapter can draw this power either through the PC's keyboard port, using its own pass-through plug, or via a standard 5V AC adapter plugged into a wall outlet.



TOM GIBSON

Apexx Technology's portable PCTalk adapter makes it easy to add LocalTalk connectivity to a PC.

PCTalk comes bundled with Farallon Computing's PhoneNet PC software, which provides the AppleTalk protocols and client software that let PC users log on to AppleShare servers through a Chooser-like interface. Apexx's optional PCTalk Timbuktu package ($399) includes Farallon Computing's Timbuktu for Windows PhoneNet Kit, through which a PC user running Windows can remotely control any Mac that is on the network and equipped with its own copy of Timbuktu. Apexx, 208/336-9400, 800/767-4858.—MARGIE WYLIE

IN BRIEF

Ethernet Prices Plummet Apple, Sonic Systems, and Dayna Communications have slashed Ethernet adapter prices. Apple (408/996-1010) is now selling its first card that costs less than $100, the Apple Ethernet LC Twisted-Pair card ($99), which connects Mac LCs to 10BaseT networks. Sonic Systems (408/736-1900) cut Ethernet prices across its entire line by as much as 61 percent, reducing half its adapters to retail prices under $100, with no adapter priced over $150. Dayna (801/269-7200) cut its line by up to 40 percent with less drastic results: its cheapest adapter is now priced at $129, with prices for its innovative external adapters still ranging up to $379.

Management Update Sonic Systems recently updated two programs: Radar 4.0 ($499), network-monitoring software, sports a new scripting system, among other improvements. Server Sentry 2.0 ($499), AppleShare-server remote-control software, lets you add new users and groups on the fly and cleans up some bugs that caused previous versions to crash. Updates to previous versions of either product are available for $99. 408/736-1900.

Virus Hunting

WITH TECHWORKS' GRACELAN NETwork Manager 3.1 ($795) and Datawatch's Virex 5.1 ($99.95), administrators can run virus scans, receive scan reports, and perform virus repairs on all Macs on an AppleTalk network, without interrupting service to users. TechWorks supplies the upgrade free to 3.0 owners; 2.0 users pay $199. TechWorks, 512/794-8533, 800/680-6847; Datawatch, 919/549-0711.—MARTHA STRIZICH

No Boundaries
NO LIMITS

Networking Macs With Built-In Ethernet Is Now A Small Matter.

Very Small.

Power Macintosh 8100/80



EasyNet Transceivers. Small Size, Low Cost, Guaranteed.

When buying Power Macs and other computers with built-in Ethernet, don't overlook one small thing. The hot new EasyNet™ transceivers from Dayna. These clever little connectors are the easiest and most affordable way to connect devices with an on-board Apple Ethernet port to either thin Ethernet or 10BASE-T networks.

FEATURES	
Low Retail Price	✓
Only 2.25" x 1.5"x .75"	✓
Thin Ethernet Support	✓
10BASE-T Support	✓
IEEE 802.3 Compliant	✓
100% Apple Compatible	✓
Made in the USA	✓
Lifetime Warranty	✓
24-Hour Replacement	✓

They're ideal for Power Macs, Quadras, LaserWriters and other Apple products with built-in Ethernet, as well as non-Apple devices that use the same mini-Ethernet port.

Part Of Our Complete Solution.

EasyNet transceivers are the smallest addition to Dayna's large family of Ethernet products. Our full line of adapters and SCSI connectors support all Macintosh models and all Ethernet cable types.

Getting Power Macs connected to Ethernet is no big deal. In fact, with Dayna, it's a very small matter indeed.

For more information on Dayna's Ethernet networking products, call 1-800-443-2962, ext. 831, or use our 24-hour FAX response service.



EasyNet transceivers provide plug-and-play connections to 10BASE-T and thin Ethernet networks.

FAX Response: 801-269-7340, Doc.#1250

Dayna®

EasyNet and No Boundaries, No Limits are trademarks of Dayna Communications, Inc. All other product names are the trademarks of their respective holders.
©1994 Dayna Communications, Inc., Sorenson Research Park, 849 West Levoy Drive, Salt Lake City, UT 84123

Circle 161 on reader service card



BY CARY LU

PowerBook Notes

Managing SCSI Devices

THE HARD DRIVE AND THE SCSI PORT ON a PowerBook behave pretty much like the equivalent features on a desktop Mac, but they aren't entirely the same.

Using Multiple System Folders

When you set up a PowerBook's hard drive, you can choose one of two completely different strategies. One is to install all the trappings of a typical desktop Mac's hard disk. The other is to install a lean, mean system; see *PowerBook Notes*, February 1993. In fact, you probably want both—one for the office, the other for the road. Or you may need to switch to a foreign-language system. You can switch between a rich and a lean System Folder with an extension-manager program that lets you change the active control panels and extensions at start-up.

There are two ways to install multiple System Folders. One is to simply put them all on the hard drive. Many people warn against this, but all Mac operating systems beginning with System 6 can handle multiple System Folders. However, one essential trick is required—you must choose, or "bless," the specific System Folder you want to use with System Picker, a free program by Kevin Aitken available from online services and bulletin boards (Blesser, an older program for the same function, apparently has not been updated since 1987). To change System Folders, use System Picker to bless another folder and then restart. You should give each System Folder a distinctive name, and you must keep track of which System Folder you are working with or modifying at any given time.

I prefer the second method: divide the hard drive into multiple partitions and install a different system in each one. The



disadvantage is that each partition takes up a fixed amount of storage space; since you need to provide some extra space in each partition for possible changes to the System Folder, you might run out of storage space a little more quickly.

Apple HD SC can set up multiple partitions on a hard drive, but only one of those partitions can start up the PowerBook. To set multiple start-up partitions, try Drive7 ($79.95 from Casa Blanca Works, 415/461-2227) or Hard Disk Toolkit, Personal Edition ($79 from FWB, 415/474-8055). Drive7 can change the start-up partition more easily than Hard Disk Toolkit. You can't change the start-up partition with Apple's Startup Disk control panel, because it selects only the SCSI address, which is the same for all partitions on the drive.

Two start-up partitions offer some additional advantages. If you need to install system modifications or need to test a partition, you can start up from the other partition. Another plus is the ability to compress one partition.

What are the optimum partition sizes? There's no simple answer. A small partition can hold an alternate System Folder and a disk utility for emergencies, leaving a large partition for everything else. But if you plan to use compression on a partition, it should be big enough to make compression worthwhile.

SCSI Cabling Conundrums

Other ways to use multiple systems involve connecting the PowerBook to an external hard disk drive or to another Macintosh. One start-up partition can manage the PowerBook alone; a second can manage the resources on the external hard disk or the other Macintosh.

A PowerBook's SCSI port is more complicated than a desktop Mac's: it has a different connector, operates in two distinct modes, and often requires two terminators rather than one (see "Connecting Cables"). For an all-in-one PowerBook, you should have two terminators rather than one when connecting an external SCSI device; for details, see the PowerBook manual. By contrast, the Duo's SCSI port behaves like a desktop Mac's, using a single terminator. Some SCSI devices come with internal termination. If you connect any PowerBook to a Mac IIfx, use the IIfx's special black terminator.

Depending on the SCSI device, you may need either a C-50 terminator or a DB-25 terminator. If you use an HDI-30/DB-25 adapter in SCSI disk mode, vendors such as APS Technologies say that no terminator is necessary to connect to most Macs, despite Apple's recom-

continues

CONNECTING CABLES

All SCSI ports built into PowerBooks use a squarish HDI-30 connector, unlike the DB-25 female plug of the desktop Macs. (A few third-party docks for Duos come with a DB-25 connector.) Most SCSI peripherals—such as hard disk drives and scanners—have female 50-pin connectors, although some use DB-25 connectors.

The PowerBook functions in one of two SCSI modes, depending on which type of cable is used.

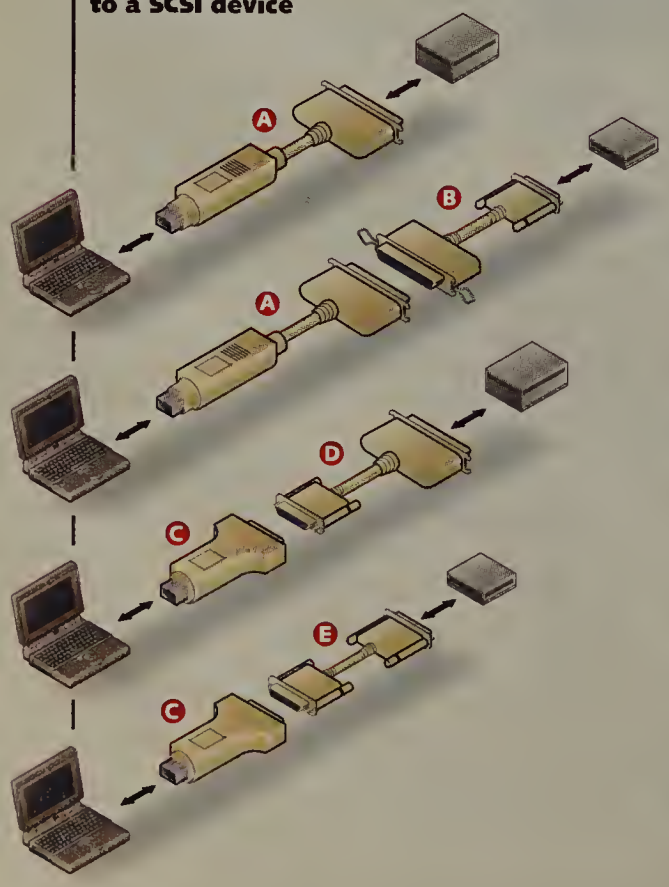
- In SCSI standard mode, the PowerBook typically connects to SCSI devices with a 29-pin HDI-30 cable ending in a male C-50 connector.
- In SCSI disk mode, the PowerBook typically connects to another Mac with a 30-pin HDI-30 cable ending in a female C-50 connector, which mates to a standard male C-50 cable ending in a male DB-25 connector that plugs into the other Mac. The PowerBook functions as an external hard drive for the other Mac. When in SCSI disk mode, the PowerBook should not be closed or it will overheat.

If you already have a lot of SCSI cables, the simplest way to connect everything to a PowerBook is to get an HDI-30–to–female-DB-25 adapter, which costs between $30 and $50. These adapters come in two main styles; some turn the DB-25 connector vertically, so you can easily insert and remove the adjacent plugs (ADB and telephone cord for the modem). The more conventional horizontal adapters from APS Technologies (816/483-6100, 800/874-1428) work fine but can interfere with the adjacent plugs; that kind of adapter won't work on a PowerBook 100 with a floppy drive. Some versions of both the vertical and APS adapters support (through a built-in switch) both SCSI standard mode (29-pin) and SCSI disk mode (30-pin). The SCSI-disk-mode setting creates a potential termination problem, however (see the main text). In the diagrams, SCSI terminators (except in the special case of the IIfx) are omitted for simplicity, and because all-in-one PowerBooks require two terminators while Duos require only one.

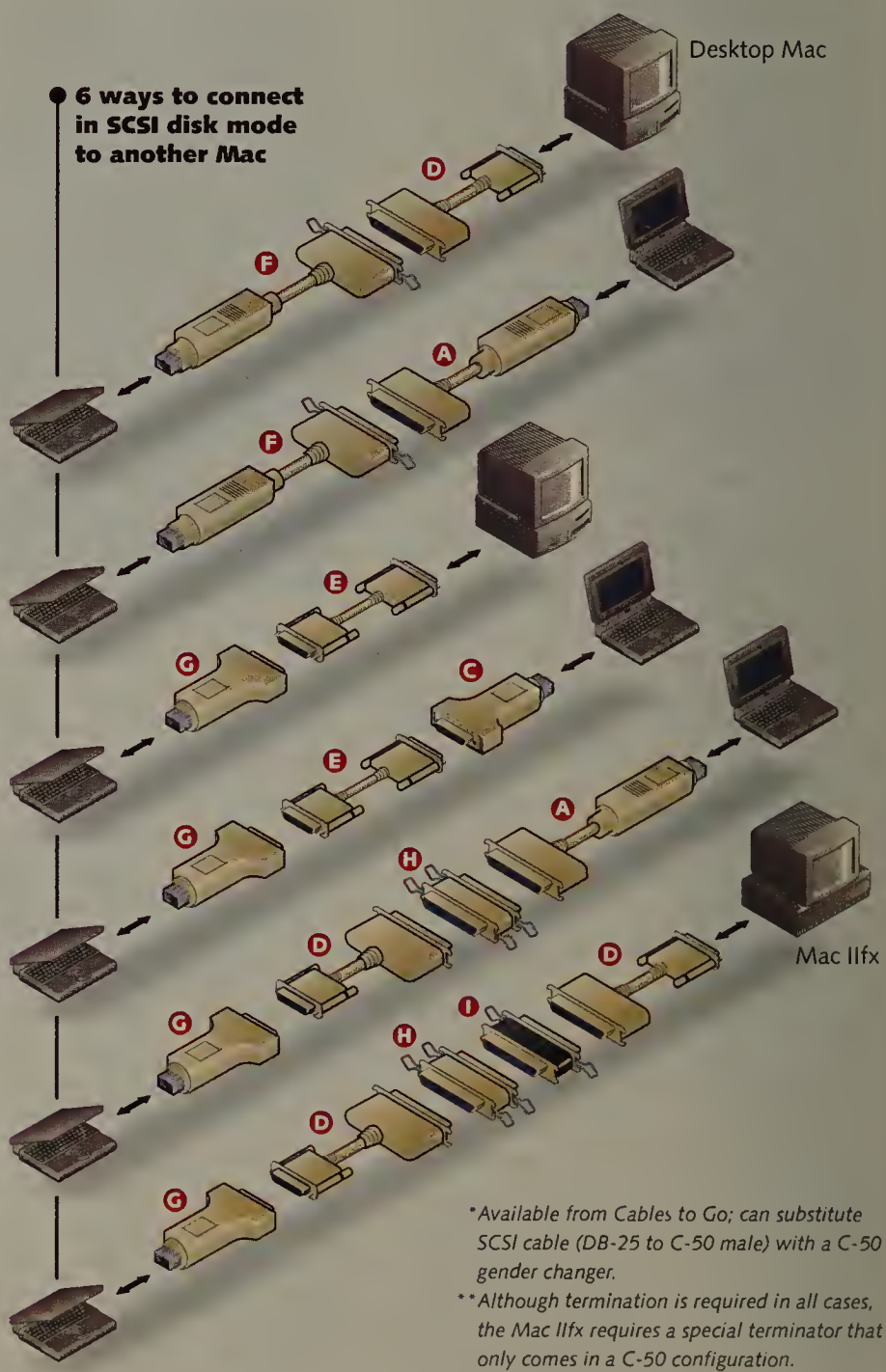
If you haven't already invested in cables, you're better off getting one of the HDI-30–to–C-50 cables; they're more compact and simpler to use, but they don't come with a mode switch.

- A SCSI system cable (29-pin), HDI-30 to C-50 male
- B C-50 to DB-25 SCSI system cable*
- C Adapter, HDI-30 to DB-25 female (29-pin SCSI mode)
- D SCSI cable, DB-25 male to C-50 male
- E DB-25 serial port cable (all pins wired straight through)
- F SCSI disk mode cable (30-pin), HDI-30 to C-50 female
- G Adapter, HDI-30 to DB-25 female (30-pin SCSI disk mode)
- H C-50 gender changer
- I Mac IIfx terminator**

4 ways to connect to a SCSI device



6 ways to connect in SCSI disk mode to another Mac



*Available from Cables to Go; can substitute SCSI cable (DB-25 to C-50 male) with a C-50 gender changer.

**Although termination is required in all cases, the Mac IIfx requires a special terminator that only comes in a C-50 configuration.

What Looks Like A Trinitron® Monitor, But Is Bigger And Better?





The Diamond Pro® 21T Featuring

DiamondTron™

A New CRT From Mitsubishi Electronics

Say good-bye to Trinitron. Mitsubishi's DiamondTron CRT ushers in a new era in high-performance monitor design for all high resolution Macintosh® II and Quadra® applications.

With a big 21-inch screen (20" viewable), the DiamondTron CRT is nine square inches larger than the largest desktop-size Sony® Trinitron.

The DiamondTron CRT also delivers superior performance. Its new hybrid design incorporates a vertically-flat, square-cornered screen with an aperture grille mask to minimize glare while increasing brightness. Plus Mitsubishi's proprietary NX-DBF™ (Dynamic Beam Forming) electron gun provides exceptional center-to-corner focus and brilliant edge-to-edge clarity. And the exclusive Diamond Control software (available August 1994) lets you set up the expanded array of monitor adjustment functions on-screen, including full-power management capabilities for auto-dimming or shut down.

Best of all, you can get all the benefits of advanced DiamondTron technology in our Diamond Pro 21T monitor for just $2,525 MSRP.

For more information about DiamondTron and the Diamond Pro 21T monitor, call us at 1-800-843-2515. In Canada call 1-800-387-9630. *For immediate product specifications, call Mitsubishi Qwikfax at 1-800-937-2094.*

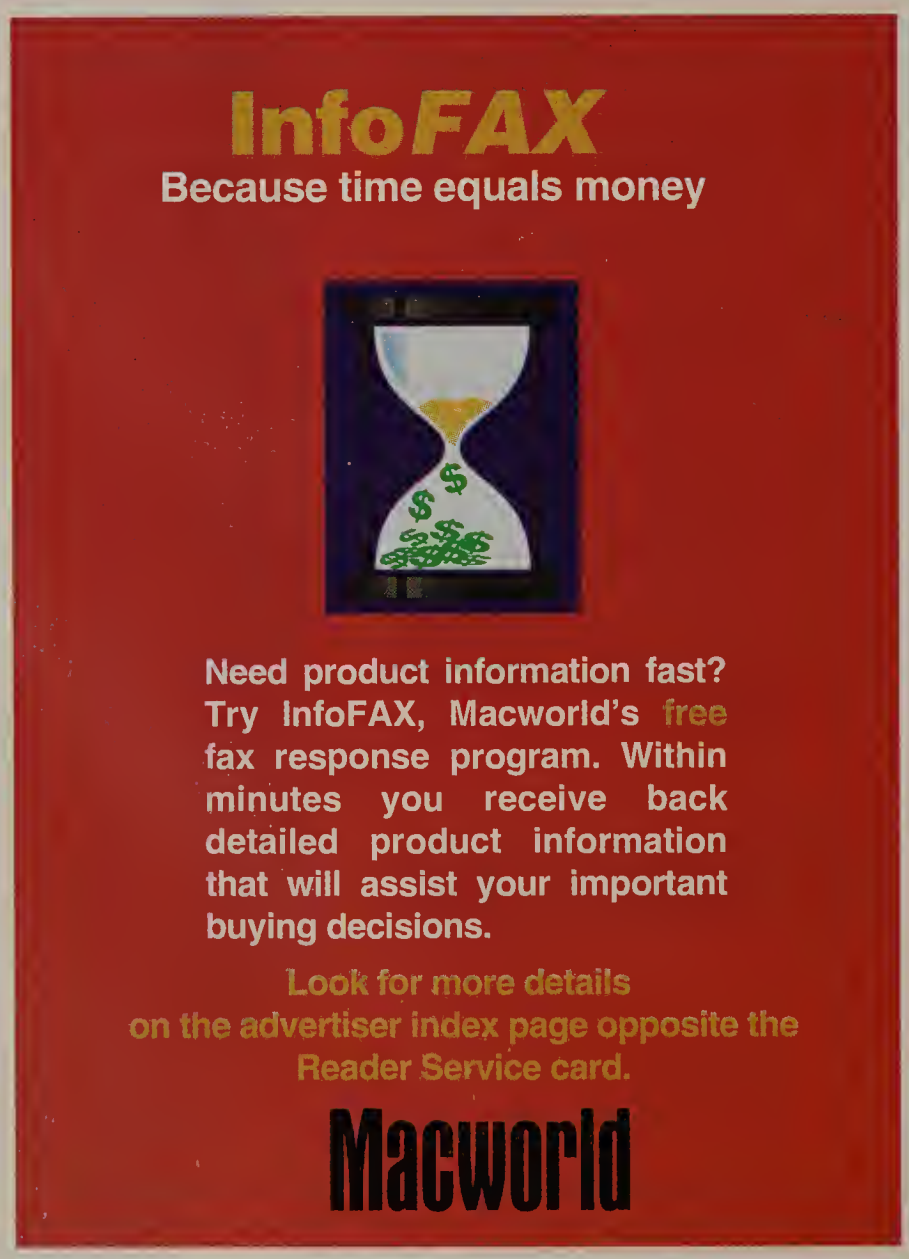
MITSUBISHI
DISPLAY PRODUCTS

©1994 Mitsubishi Electronics America, Inc. DiamondTron and NX-DBF are trademarks and Diamond Pro is a registered trademark of Mitsubishi Electronics America, Inc. Trinitron is a registered trademark of Sony Corporation. All other trademarks and registered trademarks are the property of their respective holders. *Circuithead* screen image produced by Jim Ludtke using ElectricImage Inc.

Circle 261 on reader service card



Circle 238 on reader service card



mendation. For a IIfx, the only way to get the cables to match and include a IIfx terminator is by adding a C-50 gender changer or another SCSI device with two C-50 connectors. I've never seen a IIfx terminator in a DB-25 form. For C-50 gender changers, try Interex Computer Products (316/524-4747) or Cables to Go (513/224-8646, 800/826-7904), which also sells SCSI cables with reversed-sex connectors.

Before connecting a SCSI cable in either standard or disk mode, you must make sure the PowerBook is shut down, not merely asleep. This includes the Duo Dock and Duo MiniDock. (However, a floppy drive, mouse, and external keyboard may be safely attached via a dock to a *sleeping* Duo.) Also be sure to turn on any attached SCSI devices before you turn on the PowerBook; when you are done, shut down the PowerBook first and then turn off the SCSI devices.

Using SCSI Disk Mode

To support SCSI disk mode, the SCSI interface in PowerBooks differs from that of desktop Macs. SCSI disk mode reassigns a PowerBook's internal SCSI hard drive address a number between 1 and 6 (0 and 7 are taken by the other Mac and its internal hard drive), set in the PowerBook or PowerBook Setup control panel. You must also make sure that the hard disks on the PowerBook and the other Mac have different names and that no two devices in the SCSI chain have the same SCSI address.

For SCSI disk mode, follow the instructions in the PowerBook manual. Shut down both Macs before connecting or disconnecting—or you risk losing data. Do not unmount a PowerBook's SCSI icon by dragging it to the Trash; you may damage the directories of all mounted drives. Don't use a terminator when connecting to another PowerBook. If a PowerBook has a SCSI-disk-mode cable attached but not connected to another device, it won't start up normally.

The PowerBook 140, 145, 145B, and 170 lack the necessary ROM code for SCSI disk mode. However, the $249 Laptop Liberator from Software Architects (206/487-0122) supplies a combination hardware SCSI adapter and software that supports SCSI disk mode on those models. Laptop Liberator can also create and format a DOS partition on a PowerBook hard disk so any PowerBook can connect as a SCSI drive to a DOS or Windows machine with a SCSI interface. **m**

CARY LU is a *Macworld* contributing editor who covers mobile- and remote-computing issues in this monthly column.



NOW AVAILABLE AT:
ComputerWare, Computize, Creative Computer, MacWarehouse, MacConnection, Fry's, J&R, and many other major resellers.

"The best solution if you regularly need longer battery life" –*MacWeek*

Now use your PowerBook up to five times as long – without swapping and recharging batteries, dimming your screen, slowing your processor, or staying within six feet of an AC outlet

Remember the day you first brought your new PowerBook® home?

It was faster than a speeding bullet. More powerful than a locomotive. Able to leap tall buildings in a single bound. In fact, the two of you could do anything.

But then it happened . . .

The Big Chill

Your first low battery warning. That's when *everything* changed.

You quickly discovered that if you use all the performance your PowerBook offers, the battery just doesn't last long enough.

Finally, there's a solution.

- ***3 or 5 times the battery life***
- ***Attaches easily to PowerBook***
- ***Charges with Apple AC adapter***
- ***NEW! Free CPU software***
- ***Cost effective***
- ***No "memory-effect"***

CPU CONNECTIX POWERBOOK UTILITIES

Power Breakthrough

Introducing PowerPlate™ rechargeable power systems, designed specifically for PowerBooks.

Quite simply, PowerPlates solve all your battery frustrations. (In fact, you may wonder how you ever got along without one.)

PC LapTop Magazine concluded, *"This is the best computer purchase you'll make all year."* And thousands of users agree. One even wrote to say his PowerPlate was *"The best product I've ever purchased in the Mac world."*

Call Toll-Free Today

See your dealer today, or for more information, just call us toll-free.

1-800-305-7936

Department G05

Technöggin

1018 Delta Ave • Suite 303 • Cincinnati OH 45208
Phone 513-321-1777 • Fax 513-321-2348

POWERPLATE mini3

"A bargain" -MacWEEK

Ultra-compact design provides 2.5 to 3 times the battery life of PowerBook battery alone. Only 9.4" by 5.6" – an easy fit in any carrying case. Our most cost-effective power solution. ***$169.95***



POWERPLATE 3x

"The best solution if you regularly need longer battery life" -MacWEEK

PowerBook-footprint design provides 2.5 to 3 times the life of PowerBook battery alone. Two-stage charging with LED indicators. ***$239.95***



POWERPLATE 5x

"Almost an automatic purchase for color PowerBook users" -MacWEEK

The ultimate system: provides 4 to 5 times the battery life of PowerBook battery alone. Perfect for power-hungry color PowerBooks. ***$299.95***



© 1994 Technöggin Inc. Technöggin and PowerPlate are trademarks of Technöggin Inc. PowerBook is a registered trademark of Apple Computer, Inc. CPU is a trademark of Connectix Corporation.

Circle 94 on reader service card

He eats your storage space

FOR LUNCH

and your money

FOR DINNER.



You're well acquainted with this megabyte-eating beast.

But perhaps you're not yet familiar with DynaMO,™ the magneto-optical solution that eliminates the horrors of data storage.



Drive Specifications	
Capacity	128-230 MB
Data transfer rate	2.1 MB/s (max.)
Average seek time	30 ms (typ.)
Rotational speed	3,600 rpm

This compact little set-up will save you big. Like Syquest, you put an external drive on-line and save your files to removable, rewritable cartridges. But unlike Syquest, you don't have to break the bank each time around.

With DynaMO, you can use 128 and 230 MB industry standard 3.5-inch cartridges. The cartridges aren't vulnerable to the everyday abuse that might otherwise do in your data. In fact, Fujitsu cartridges are so reliable we back them with a lifetime warranty.

There's nothing frightening about setting-up DynaMO either. You just plug the drive into your PC or Macintosh.

Get the data on DynaMO by calling **1-800-831-4094.** Or request information by fax at 1-408-428-0456 (document 1368).

We'll show you how to enjoy some monstrous savings.

© 1994 Fujitsu. All rights reserved. DynaMO is a trademark of Fujitsu Computer Products of America, Inc. All brand names and product names are trademarks of their respective holders.

FUJITSU

COMPUTERS, COMMUNICATIONS, MICROELECTRONICS

Circle 202 on reader service card



BY DAVID POGUE

Multigrain Serials

What to do when one modem port just isn't enough

IMAGINE THAT YOU WERE BORN with only one nostril. Imagine wearing sneakers with lace-holes on only one side. Imagine that you just purchased a $30,000 minivan—and it seats *one*.

That's essentially the situation with your Macintosh. It has only one modem port. Into this single jack you're supposed to plug not only your modem, but also your music equipment (MIDI synthesizers), your MacRecorder microphone, your Wacom drawing tablet, your miniature label printer, your Sharp Wizard, perhaps your StyleWriter printer, and all manner of other Macintosh gadgetry. Can you say *hopeless?*

For thousands of Macophiles, the act of plugging and unplugging equipment from that solitary port and communing with the dust bunnies behind the computer is an unpleasant daily ritual. It's not exactly heaven for the machine, either; these little back-of-the-Mac jacks are among its more fragile components, never designed for such repetitive stress.

So wait a minute. They make multiplug adapters for electrical wall outlets, right? They make faucets with a little hand sprayer coming out of the side. They make Y-connectors for telephone jacks. Why don't they make one for the modem port? What's the big hairy deal?

As I researched this column, assorted Silicon Valley engineers were laughing their heads off at my naïveté. Didn't I realize that "the plus-five voltage won't support the minimum acceptable impedance for serial peripherals" (or something to that effect)?

When the hilarity subsided, I managed to extract the following information. The Macintosh feeds a feeble drool of electricity into the modem port—just enough to power whatever's plugged in there. Even adding *one more* gadget, even a simple Y-jack, reduces the current coming out of each half. When current is diluted, some of the most common modem-port pluggables—the MacRecorder and most MIDI interfaces, for example—don't find the juice they expect. And they don't work.

The challenge is not just to find a switcher; it's to find one that works with everything.

Manual A/B Switch Boxes

The simplest solution is a little gray box with a knob, called an A/B switch box. You turn the knob to channel your modem port's attention from one device to another. You can buy these things from electronics catalogs and such; Microcomputer Cable (313/946-9700) sells A/B, A/B/C, and A/B/C/D (two-, three-, and four-port) boxes for $22, $36, and $42, respectively. Those prices don't include the plain old StyleWriter cable you need to connect the box to your Mac.

In the coming paragraphs, you'll find out about all kinds of fancy electronic solutions to the modem-port dilemma.



Most are simply glorified A/B/C/D boxes at ten times the price. To the certain disgust of electronics freaks everywhere, I maintain that it's actually easier to turn a physical knob than to open a desk accessory and click on a selection.

Ah, but, for the same reason the hero never gets killed ten minutes into the movie, I wouldn't start the column with this idea if it solved everything. The problem, of course, is the aforementioned MacRecorder-MIDI failure, hereafter known as the MR-MIDI issue: the A/B split saps the modem port's tiny trickle of electrons. (MIDI interface models equipped with their own power cords are immune to the MR-MIDI problem.)

Axion Switch

The next step up from a manual box is the Axion Switch (Axion, 408/522-1900; $129). It's the closest thing the Mac has to those multiplug wall-socket adapters. It's a gracefully designed, T-shaped gray thing that plugs into our favorite jack. You can plug three devices into the T. Axion's hassle-free idea: you switch your Mac from one device to another from the menu bar.

The Axion Switch is subject to Ye Olde MR-MIDI Problemme. The Axion engineers, however, were savvy enough to foresee the trouble. For an extra $20, they will sell you a supplementary power cord that grabs a few fractions of a watt from, of all places, your *keyboard* jack. The power cord's two dangling wires, combined with the incoming cords from your equipment, creates quite a cacophony of cables. But hey—cords, schmords—the thing *works!*

Port Juggler

The Most Promising Technology That Doesn't Quite Work award goes to the Port Juggler (Momentum, 808/263-0088; $99). Picture a compact, black plastic box about the size of a Sony Walkman. It seems designed to wipe Axion off the map: it's less expensive, it's got four ports rather than three, it requires no dangling power-cheater cord, and—here's the piece of resistance—the Port Juggler switches from device to device *automatically*. You teach the thing which device each of your programs prefers: America Online wants the modem, Finale wants MIDI, ClarisWorks wants the StyleWriter, and so on. After that, the correct device gets activated automatically when you switch programs. Pure genius.

continues

Well, on paper. In reality, the Port Juggler is not so much an Axion killer as it is a serial killer—it doesn't work with MIDI. The kindly inventors at Momentum worked feverishly through the harsh Hawaiian winter to solve the problem; at this writing, they're on the verge of unveiling version 2, which they say licks not only the MIDI nightmare, but the port-traffic problem, too (see the sidebar, "Ports in the Dark"). If this is true, the world will be a better place.

MP-91 MultiPort

A few Macintosh-accessory junkies are about to become very, very happy. This baby (Silicon Valley Bus, 408/623-2300; $229) has more openings than a Swiss-cheese factory: six serial ports and—here's the twist—five *keyboard/mouse* jacks. These ADB ports accommodate an entire second-class of Mac add-ons: remote-control mice, some digitizing tablets, certain modems, and some other devices. (You can use only two of the serial ports simultaneously—your network or printer will almost certainly be on one of them—but you can use all of the ADB ports at the same time.)

Whereas the Axion and Port Juggler boxes sit in the cable-crossed wilderness behind the Mac, the MP-91 MultiPort is groomed for public display. It connects to your Mac in three places—the modem, printer, and ADB ports—via thin, gray, 5-foot extension cords. The box itself is the size of a paperback romance novel and sits on your desk, making its 11 jacks immediately accessible.

The MultiPort's desk accessory for switching ports isn't nearly as handy as the Axion's menu-bar switcher. Otherwise, the thing works great.

QuadraLink

So far you've been reading about modem-port switchers. How would you react to finding out about a modem-port multiplier—a device that actually gives you four ports all working *simultaneously?*

Well, you know me. I went wild. I canceled my appointments and turned off the phone. I tore open the QuadraLink—a plug-in NuBus board—as though it were a shiny red sled I'd found under the tree. Imagine: four ports at once! I could download while listening to the synthesizer! I could print labels while doodling on a Wacom tablet! I could—I could . . .

No, I couldn't. It turns out that the QuadraLink's multiport talents rely on a piece of Apple software (built into System 7) called the Communications Toolbox, or CT. This little module serves as a behind-the-scenes patch bay for Macs with additional serial ports. All CT-aware programs can use the QuadraLink's ports simultaneously.

Except guess what? Other than modem programs, I can count the number of CT-aware programs in the universe on two toes. And without CT savvy, the QuadraLink (Applied Engineering, 214/241-0055; $219) is little more than an electronic switch box, just like the Axion or the Port Juggler—and one that suffers from MR-MIDI disease, at that. Worse, switching between ports requires a slog to your Control Panels folder.

Fortunately for MR-MIDI sufferers, the QuadraLink leaves your actual modem and printer ports empty. Brilliant idea: snuggle your MIDI and MacRecorder happily into those real ports, and plug everything else, including your printer or network, into the QuadraLink itself. Of course, you can still use only two ports at a time, exactly as you could before the QuadraLink, but at least it all works. (If you use high-speed modems on pre-Quadra Macs, you may prefer the port-speed goose-up provided by the $366 QuadraLinkDMA card.)

Hurdler Serial Board

The Hurdler is the QuadraLink's blood rival. The pros and cons of this NuBus card are exactly the same as the QuadraLink's except that you can't plug your AppleTalk connector into this one. You can use the Hurdler's four ports simultaneously only with CT-aware programs, the MR-MIDI problem persists, and you use a control panel—an ancient-looking one appropriated from those old Prometheus internal modems—to switch ports. To top it off, Creative Solutions (301/984-0262) wants $379 for the four-port model. Unless you're a techie running a BBS out of your home or something, I would pass it up.

The Upshot

If you have neither MIDI gear nor a MacRecorder, get yourself a manual switch box. It'll save you a lot of money compared with the electronic solutions, and heaven knows, you'll suffer fewer extension conflicts.

If synthesizers and microphones do, in fact, vie for a place at your serial trough, it's a no-brainer: get the MP-91 MultiPort, with its festival of jacks. (But what about the above-mentioned virtues of the Axion Switch and the QuadraLink? Get this: due to a freak alignment of the planets, at press time Applied Engineering was no longer in business. At the same time Axion's message machine said the company was restructuring. Sorry if I got your hopes up.)

Apple makes computers that scream at 80MHz, obey spoken commands, and fit inside your wallet. Yawn. Wake me when they add another modem port. **m**

Contributing editor DAVID POGUE is the author of the number one Mac best-seller *Macs for Dummies* and its inevitable sequel, *More Macs for Dummies* (both IDG Books Worldwide, 1994). He lives in Manhattan, usually crouched behind his computer among the dust bunnies.

PORTS IN THE DARK

If you decide on one of the electronic port-switchers, attempt to buy it with a credit card and a money-back guarantee. As my friends the Silicon Valley engineers emphasized, serial-port doctoring is a black art with plenty of gray areas. Trying to get multiple programs to share a single port without squabbling is like juggling rattlesnakes.

Momentum's Murat Bicakci has a good analogy. "It's like a big family with only one bathroom," he says. "Some people knock politely to see if the bathroom's occupied. Others just barge right in." (He calls Global Village's fax-modem software well behaved, and says that the StyleWriter driver seizes the port without regard to other programs' activity.) Furthermore, once they are in the bathroom, some people refuse to come out (MIDI programs, for example); others stay in as long as they wish, brushing their hair and teeth, but vacate courteously if somebody else knocks on the door (Faxstf fax-modem software).

The point: Whichever switcher you choose, always turn it to the appropriate virtual jack *before* launching a serial-seeking program. If you turn your switcher from modem to MIDI *after* starting your MIDI music program, for example, the program won't work—and you may get a system freeze or crash as a bonus.

Even then, no matter which switcher you use, no matter how many optional power cords you add, some devices may not work properly with some software. The complications most often cited involve the AV Macs' Geoport (which doesn't work with *any* external switchers), Apple Remote Access, Wacom tablets, and Faxstf software.

It SHOWS.

Watch A Mac Compatible Monitor From CTX





Shown: CTX1785GM

As a prominent leader in today's display technology, CTX proudly introduces its new GM Series of Macintosh compatible products that may change the way you think of monitors.

In sizes from 14" to 17", the GM Series provide features and capabilities that meet virtually any user's requirements for performance, resolution and price. Low Radiation (MPR II) and Power Saving Management are standard. As you may know, CTX monitors are built through stringent internationally recognized quality standards, such as ISO-9000. They offer crisp, steady and brilliant images as well as advanced features, while maintaining superb reliability and affordability.

To get a closer look at these true quality world-standard monitors, contact your nearest CTX dealer today.

MODEL	1462GM	1562GM	1565GM	1765GM	1785GM
CRT	14"	15"	15"	17"	17"
Dot Pitch	0.28mm	0.28mm	0.28mm	0.27mm	0.26mm
Scan Frequency	H:30-62KHz	H:30-62KHz	H:30-65KHz	H:30-65KHz	H:30-85KHz
	V:50-90Hz	V:50-90Hz	V:50-90Hz	V:50-90Hz	V:40-100Hz
Macintosh Compatibility	640x480/67Hz 832x624/75Hz	640x480/67Hz 832x624/75Hz	640x480/67Hz 832x624/75Hz	640x480/67Hz 832x624/75Hz	640x480/67Hz 832x624/75Hz 1152x870/75Hz
Full Screen	Yes	Yes	Yes	Yes	Yes
Low Radiation	Yes	Yes	Yes	Yes	Yes
Digitol Control	-	-	Yes	Yes	Yes
Power Saving	Yes	Yes	Yes	Yes	Yes

CTX

Committed To Xellence

Technical Support
1-800-888-2012
BBS: (909) 594-8973

ISO 9002 Certificated Manufacturer ISO 9000

energy EPA POLLUTION PREVENTER

DSFINUL SP FTZ Class B
MPR II ISO9241 FCC Class B

CTX INTERNATIONAL, INC.

USA Headquarters
20530 Earlgate Street
Walnut, CA 91789
909/595-6146
Fax 909/595-6293

Southern Region
6624 Jimmy Carter Blvd.
Norcross, GA 30071
404/729-8909
Fax 404/729-8805

Eastern Region
481 Edward Ross Drive
Elmwood Park, NJ 07407
201/646-0707
Fax 201/646-1998

Midwestern Region
500 Park Blvd., Ste 295C
Itasca, IL 60143
708/285-0202
Fax 708/285-0212

Southwestern Region
1225 E. Crosby Rd., Ste. A21
Carrollton, TX 75006
214/416-9610
Fax 214/245-7447

Copyright © 1993 CTX International, Inc All rights reserved. All brand and product names are trade marks or registerd trademarks of their original owners
The ENERGY STAR™ emblem does not represent EPA endorsement of any product or service
Macintosh is a registerd trademarks of Apple Computer, Inc

End users circle 38 on reader service card SEE US AT COMDEX BOOTH #1006 **Dealers circle 39 on reader service card**

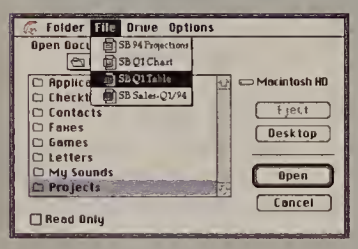
The critics would tell you Now Utilities makes your Mac faster and easier to use.



That is, if they weren't still speechless.

Now Utilities has won so many top awards lately, the critics almost seem awestruck. But when they do speak, you'll find their comments echo those of author/consultant Bob LeVitus, who calls Now Utilities "a must have for any serious System 7 user." Why all the fanfare? Because Now Utilities makes your Macintosh so much faster and easier to use.

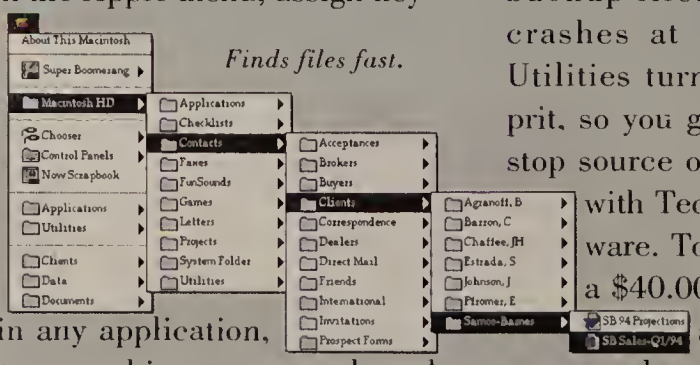




Easy instant access.

Saves time.

Now Utilities saves time by giving you instant access to frequently used files and folders. No more time wasted digging through endless folders in the Finder. You navigate your hard drive faster because you can open items directly from submenus in the Apple menu, assign keyboard shortcuts to any menu item, and locate misplaced files in a flash. Even if they've been compressed or archived. What's more, you can reuse boilerplate items of any type in any application, and organize, view and store graphics, text, sounds and QuickTime movies.



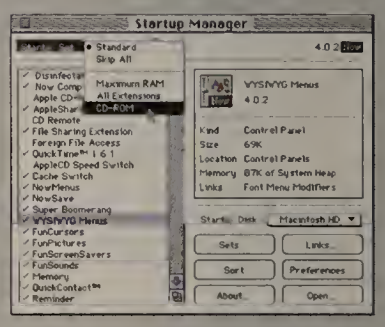
Finds files fast.

More control.

Now Utilities puts you in control. If you use Times the most, just drag it to the top of the Font menu. Fonts appear in their actual typefaces, so you choose the right font the first time. You can also arrange extensions and control panels in the order they work best, and link together extensions that require each other.

Keeps you going.

No more lost work if you lose power: Now Utilities automatically saves your work at any interval you specify. You can even save every keystroke to a special backup file. If your Mac crashes at startup, Now Utilities turns off the culprit, so you get back up and running. It's even a one-stop source of system information, perfect for dealing with Tech Support questions for any of your software. To order Now Utilities today for just $89.95*, a $40.00 savings off the list price, call us directly at **1-800-237-2078.** Or see your local reseller. We're certain you'll become a satisfied critic yourself.



Puts you in control.

Now Software

**Dealer prices may vary. For 50-packs and site licensing information call 503-237-3611, ext.131. © Now Software, Inc., 921 SW Washington, Suite 500, Portland, Oregon 97205-2823.*

InfoFAX

Please see page 199 for instructions.



THE ICONOCLAST

BY STEVEN LEVY

PowerPC to the People

How Apple RISC'd all and won

LAST MONTH I BEGAN TRACING the tale of the Power Macintosh's development. In 1990 not one but two groups at Apple were working to develop a powerful RISC machine that would position the company for greatness in the twenty-first century. The first team, originally code-named Jaguar and later Tesseract, was a well-supported group of some 30 engineers working on a sophisticated high-end machine that would be a clean break from the Mac's past. The other group, code-named Cognac, was a small but scrappy band that sought to design a low-end RISC computer that was an improvement on the Mac, not a departure from it.

In the summer of 1991, company execs kicked the ground out from under both teams by signing an agreement with IBM, the dark force that Apple had once opposed bitterly. One of the key components of the deal was the agreement to collaborate with Motorola on a new microprocessor based on IBM's RISC chip. This chip would be the engine to drive a new generation of mighty machines from both Apple and IBM.

Both the Tesseract and Cognac teams were stunned by the news. Not only did they have to meet a new deadline—January 24, 1994—but they had to create machines around a microprocessor that wasn't even designed yet! The first chips, based on an IBM design, were due from Motorola in the fall of 1992. Apple engineers were skeptical. After all, there had been all sorts of deadline problems with Motorola's 68040 chip, and Motorola was one unified company. How could a consortium attempting to combine such opposing cultures do better?

Culture Club

But in one of the first meetings between Apple and IBM engineers, a telling incident occurred. The IBM'ers dressed in blue jeans. The Apple corps wore ties. Each group had attempted to make the other one feel at home. And as it turned out, there was an ecumenical atmosphere at Somerset, the building in Austin, Texas, that was the design center for the PowerPC chip.

Good thing, too, because there was a lot of work to do. IBM's 601 chip, the first in the PowerPC series, needed almost a "ground-up redesign," says Paul Nixon, whom Apple recruited from Texas Instruments to head its Somerset contingent. At the same time, engineers from three companies worked on the design for the next two chips, the more efficient 603 and the lightning-fast 604.

Back in Cupertino, the Cognac and Tesseract teams were working frantically to design the computers themselves. Since the consortium creating the PowerPC chips agreed that the microprocessor would fit the bus design planned for



Motorola's original RISC chip, Cognac leader Jack McHenry and crew knew some of the basic structure of the low-end computer they were building. The tricky part was keeping close track of what was happening in Austin—any change in the PowerPC chip might have implications for the Apple machine.

The PowerPC 601 chip arrived in Cupertino on September 3, 1992, inside a package covered with Christmas wrapping. Cognac's prototype wasn't quite ready to go, but McHenry's team pounced on the chip anyway, immediately socketing it up to a NuBus card and hooking it into a Mac. "On Monday I got the card," says Gary Davidian, the team's emulation expert. "Tuesday we powered up. On Wednesday we were trying to boot the Mac ROM. That night we broke something, so on Thursday we got a new card. Thursday night we booted Mac software. And on Friday we demoed it."

Then the team got the chip into its box. On October 3, at approximately 5 a.m., the first prototype of a Power Macintosh using an actual 601chip was booting the Finder.

Tesser Axed

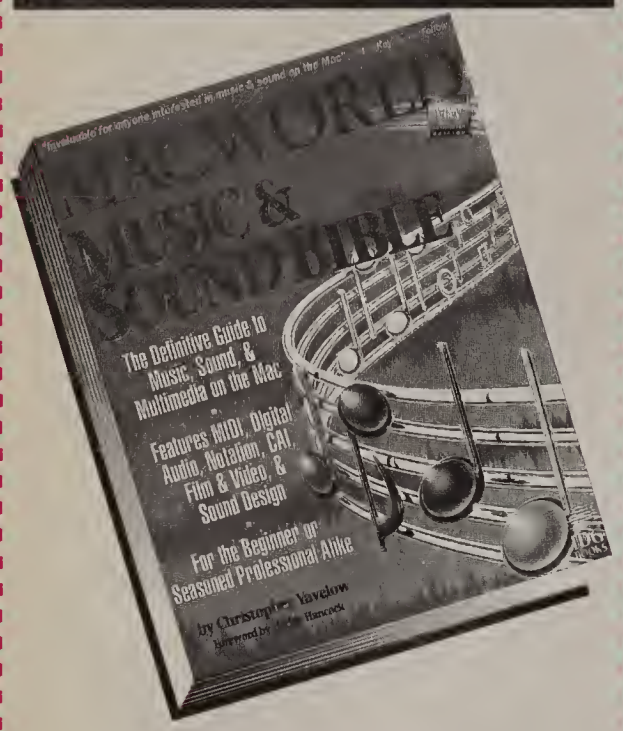
Things were not going as smoothly with the Tesseract team, which Apple execs had judged the more important project. Near Christmas of 1992, the Tesseract team realized it could not possibly ship in the early 1994 time frame. By March Apple concluded that the project was beyond redemption, and it pulled the plug on Tesseract. It was now less than a year from Apple's planned date for shipping the Power Macs, and as McHenry notes, "there was no high-end product." The whole PowerPC effort hinged on getting a replacement—fast. Apple's only hope, really, was if Cognac's machine could somehow be modified into a more powerful, feature-laden model.

"We had thought about that," says McHenry, revealing a coy political acumen that comes from ten years of computer design at Apple. All along, it seems, McHenry's squad had designed its Mac so that the CPU could be expanded. With a new deadline of March 1994, the Cognac team began transforming its modest creation into the very high-end machine that stymied its rivals.

The original low-end model was called Piltdown Man, or PDM for short.

continues

MACWORLD WROTE THE BOOK ON MUSIC & SOUND



MACWORLD MUSIC & SOUND BIBLE

by Christopher Yavelow

Finally, the definitive guide to music, sound, and multimedia on the Mac!

"Invaluable for anyone interested in music and sound on the Mac."
— Alan Kay, Apple Fellow

Covers the latest hardware, software, and techniques in music and sound

Includes over 22 studio set-ups with cabling diagrams

With dozens of interviews and forewords written by industry notables including Herbie Hancock, Craig Anderton, Alan Kay, Patrick Moraz, Curtis Roads, and more

Covers composition, rotation, patch & sample editing — even scripts and syntax guides for MIDI and multimedia

Over 1300 pages crammed with everything you need to know about using music, MIDI, and digital audio

Over 500 illustrations and figures

$37.95 USA/$47.95 Canada
ISBN: 1-878058-18-5 • 1300 pages

Available at your local book or computer store or,

Order Now!
Call 1-800-762-2974,
8a.m. – 5p.m. PST.

Applicable sales tax and a $4.00 shipping charge will be added to your order.

IDG BOOKS
IDG Books Worldwide
155 Bovet Road
San Mateo, CA 94402

The high-end model was dubbed Cold Fusion. Then a midrange version was added and code-named Carl Sagan, perhaps in honor of the billions and billions of dollars Apple hoped to reap from it.

Brady's Bunch

Once the hardware issue was settled, the PowerPC focus turned to software. In effect, Apple had to fast-forward into the next century with a successor to System 7. To manage the effort, Apple tapped Phillip Koch, a RISC expert who had been doing research at Dartmouth College. But Koch had difficulty recruiting Apple's top engineers for his team. "It was hard to get excited about building system software for a chip that was going to be in an IBM computer as well as Apple's," he says. "And it was also a case of 680X0 chauvinism."

James Gable, who moved from the Tesseract team to manage the entire PowerPC effort, was worried. "The software estimations were overly optimistic. We had a prototype, but very little native code running." His fears were confirmed when Sheila Brady, a brilliant and profane engineer, was recalled in late 1992 from a sabbatical at Harvard University to beef up the PowerPC software effort. She took one look at the massive chart with various projected delivery dates and judged the deadlines as unreliable.

Koch and Brady methodically gathered a team and began to resolve the key issues in the PowerPC operating system. The most important question was whether it would use the powers of the machine to integrate new features. Would it look different from System 7?

"Which comes first?" asks Jon Fitch, a hardware designer on McHenry's team, by way of explanation. "Should we present a high-performance computer with a high-performance interface? We decided that the transition [to a new interface] would be too abrupt. After all, we're building *Macintoshes*."

Adding even one obvious new feature to the Power Macintosh interface was judged too drastic. "So we ended up burying the differences," says Brady. But underneath the surface, the new OS was drastically rewritten. Gable ticks off some details: "All of QuickDraw is new, the memory manager is new, QuickTime is rewritten." But on screen the interface is identical to System 7.

The software turned out to be a dual success. True to the intentions of the Cognac team, it ran the current Mac software at speeds comparable to Quadras. Meanwhile, its familiar trappings cleverly concealed the fact that this operating system would one day accommodate the innovations conceived of by the now-defunct Tesseract group—telephony, voice recognition, multimedia, and all sorts of exotic interface improvements.

"We began with a core of five to ten software people and turned the company around," says Phil Koch. "It's clearly obvious that this is going to be the future at Apple."

Living Proof

The proof of this came when Apple began showing the PowerPC to developers. There were two sorts of tests developers were interested in: how would their current software run on the emulator, and how easy would it be to port a current application to the native code that would take advantage of the PowerPC's RISC speed? The first question was answered at a developers' conference in May 1993, when software companies were invited to test their applications on the PowerPC. "We offered a bottle of champagne to anyone who could break the emulator," says McHenry. At the end of the conference, not a cork had been popped.

The second question was resolved fairly neatly once developers discovered that they could port their applications to PowerPC's native code with only a few days' work. This surprised even Apple. "We thought we'd have zero native applications when we shipped the machine," says Jon Fitch. Instead there were about 30 applications; the company expects hundreds by the end of 1994. Apple, obviously, had done something right.

There seems to be a common thread in the development of every important Apple computer: it is invariably the engineers, and not the top managers, who realize what is really needed. Apple's hands-on wizards have always been able to come up with solutions before their leaders, wallowing in stock options and six-figure salaries, even understand what the problems are. The Power Macintosh is no exception. While the upper echelons at Apple struggled with boardroom coups and pink-slip distribution, Jack McHenry's team coolly saved the company.

McHenry says only that he feels proud to have been associated with Apple's new flagship product. After all, he came to Apple ten years ago for the sole purpose of designing new Macintoshes. "I remember the time of the Macintosh SE and the Mac II," he says. "It was a time when Apple could remake itself in terms of market share. We're there again with the PowerPC." **m**

STEVEN LEVY's latest book is *Insanely Great. The Life and Times of Macintosh, the Computer That Changed Everything* (Viking, 1994).

ADD YOUR *Handwriting* TO THE FONT MENU!

Signature Software

Personal Font™

The Original Cursive Handwriting Font

Version 1.1
Patent Pending

Now for Mac AND Windows!



Font Technology Breakthrough!

Now you can add your own handwriting to the Font Menu! Signature Software's Personal Font is a custom font which can reproduce your handwriting - including the exact way that you shape and connect your letters. This unique patent pending technology will actually vary the shapes of your letters depending on the characters around them. No other font can do this!

PERSONALIZE YOUR CORRESPONDENCE

With Personal Font you can join the personal impact of your own handwriting with the convenience and power of you personal computer. Imagine running your spell checker on your handwriting! Use your word processor's cut and paste features to polish up your handwritten letters. Add a friendly handwritten P.S. note to your business correspondence. Or even sign your FAX-modem messages!

CREATE YOUR FONT TODAY!

For your own Personal Font, simply write the 26 words as well as the capital letters, numbers and punctuation found on the back of this page. From that sampling, Signature Software font designers will individually convert your handwriting into a custom font which duplicates the unique way you create each word - not just each letter. Your font will include your signature and will even have a name which you specify.

HANDWRITING FROM THE KEYBOARD.

Personal Font captures your handwriting at its best. Your font has the same style and character as your own handwriting - without the inconsistencies and inkblots! With your own Personal Font in the Font Menu you'll find yourself creating handwritten notes without hesitation - straight from your keyboard!

Since each order is custom, please allow two to four weeks processing time. If you're in a hurry, for an extra $20 Signature Software will ship your order within five working days.

Actual Handwriting vs. Personal Fonts:

Peter's actual handwriting.
Peter's Personal Font.
Peter Matthews - Toronto, ONT

Colin's actual handwriting.
Colin's Personal Font.
Colin Johnson - Portland, OR

Your Personal Font can be installed and used as simply as an "ordinary" font. It appears in your menu and functions just like any other typeface in your computer.

System Requirements:

Mac - System 6.05 or higher
PC - Windows 3.1
Postscript printers or interpreters. On non-Postscript printers, characters will be disconnected, just as they appear on the screen, *similar to this.*

You're looking at a font of my handwriting. If you look closely, you'll find that each character is tailored to the characters around it. The font - by itself - does this automatically. For example, look at my "s" letters in the word "subsystems." When I filled out the form on the next page, I connected most, but not all, of my letters. Even if you don't connect ANY of your letters, everything you'd like to do in long-hand you can now do straight from your keyboard - including numbers, letters, punctuation, and your signature - in any size or style. Just carefully write 26 words and a few symbols once, and from then on all your handwriting will be at its best. I'm proud of my Personal Font and hope you enjoy yours, too!

Dave Fenwick
Signature Software, Inc.
(800) 925-8840

Signature Software, Inc.
489 N. 8th St. Suite 201 1-800-925-8840
Hood River, OR 97031 1-503-386-3221

THERE'S NO OTHER FONT LIKE YOUR PERSONAL FONT, AND HERE'S HOW TO ORDER!

ORDER YOUR FONT!

Send your completed form to:

Signature Software, Inc.
489 N. 8th St. Suite 201
Hood River, OR 97031

Because each order is custom please allow 2 to 4 weeks. Add $20 for 5 day processing. (48 hour processing is available).

*$7.50 special handling includes personalized disk, personal test document and copy of original form.

Price Reduction!
~~$229.95~~
$99.95
limited time

+ $7.50 shipping and special handling*
(Note: all prices $US)

Signature Software
Personal Font
Now for Mac AND Windows!

Dealer Inquiries Welcome

NAME

COMPANY

ADDRESS

CITY STATE ZIP COUNTRY

VISA MasterCard American Express Discover CARD NUMBER
(circle one or enclose check)

CARD EXPIRATION PHONE

CARDHOLDER'S SIGNATURE

○ 3.5"
○ 5.25"
PC Mac
(circle format desired)

☐ *YES! Rush me my Personal Font in 5 working days for $20 extra*

"For those times when Palatino or Geneva just won't do, fonts from Signature Software come to the rescue" -Computer Shopper

"I recommend these fonts for each and every person who has heard (or read) the words, 'typing is impersonal.'" -MacWorld

Also Available: **SUPERscripts** Cursive Font Pack
Five Fantastic Handwriting Fonts!
Susi
Lisa
Wilson
Joelyn
Victoria



ONLY $49.95

Special Cursive Handwriting Font Bundle
Receive BOTH Personal Font and SUPERscripts for the unbelievably low price of **$139.95**

Signature Software

Personal Font™

The Original Cursive Handwriting Font

Now for MAC AND WINDOWS

NAME YOUR FONT!

The name must be seven alphabetic characters or less.

Form#SPF

INSTRUCTIONS:

1. Name your font and write your signature (up to four parts).
2. Write the words shown within each box using the broken lines as a base.
3. Print naturally and consistently. Practice first on a separate sheet of paper. Remember, what you write here will become the final font.
4. Use a fine line rollerball or fibertip pen. **Do not use ballpoint pens or pencils!**
5. Use the grid lines in the boxes as an aid to maintain consistent height and slant. Be sure capital letters are proportional to lower case letters.
6. Write your capitals normally. Consider the appearance of capitals when at the beginning of words AND when words are all capitalized. Don't forget the punctuation!
7. Strike out mistakes and write corrections nearby. Signature Software can even make changes after you receive your font!

Signature (your name)

adjoint

bowman

cyclops

doubt

egtype

forgiven

grocery

hydrodyke

ionize

jewfishes

kagvels

lysozyme

mojxe

novque

oxyfobe

polygyne

quote

rybema

skyque

toyjoke

unfaxed

vogue

waywhips

xylose

yachtque

zigzag

An Be Co ! Do ? Ea , Fo : Go "

Hi In Ju - Ko _ Li # Mo % No $

Of & Pa (Qu @ Ro ^ So + Th - Un \

Ve Wi = Xy / Ye ' Zo ~ (1 2)

{ 3 4 } [5 6] < 7 8 > 9 0



BY DEBORAH BRANSCUM

Avoiding Disaster

You can't prevent the worst, but you can prepare for it

THE LOS ANGELES EARTHQUAKE that ripped through the headquarters of Dataproducts Corporation in January taught the peripherals company a difficult lesson. The office LAN had been backed up just before the quake, but company data was lost because some engineers hadn't backed up personal files.

"It's important to back up, back up, and back up your computer," says Jim Christian, the director of marketing for Dataproducts. Despite the lost data, the company was back in business in three days, because local employees worked at home and regional salespeople took over customer orders.

Dataproducts faced an earthquake, but power surges, hardware failures, and software problems can be just as challenging for computer-dependent companies. It's no picnic to lose your electronic lifeline; on average, by the sixth day there's a 25 percent drop in daily revenues for companies that lose their computer systems, according to a 1988 report from the University of Texas at Arlington.

Planning Ahead

Wylie Crawford is president of Kenwood Associates/US Connect, a network system integrator company in Chicago. Crawford recommends that you consider these several issues in preparing for potential disasters.

- What types of emergencies might affect your company? They could range from a custom database with a critical flaw to fire.
- What impact would each type of disaster have on your business? A crashed hard drive might slow down your ability to fulfill orders, while a flood could stop it completely.
- How long would each emergency affect your business? A power failure might last six hours, whereas a toxic spill might take six weeks to clean up.
- How can you negate or reduce the affects of each type of disaster? Consider your resources, from people to equipment, including backups to surge protectors to uninterruptible power supplies.

Because disasters can kill businesses as well as people, it's critical to prepare for the worst. Several companies specialize in devising and testing business-recovery plans, as well as providing emergency replacement equipment and facilities. Comdisco (708/698-3000) of Rosemont, Illinois, and Sungard Recovery Services (610/341-8700 or 800/247-7832) of Wayne, Pennsylvania, both work often with government agencies and large companies that use mainframes or Intel-based PC networks; but they also offer some services for Mac-reliant firms. For a monthly subscription fee, Sungard's QuickShip program, for example, provides replacement Macs.

I asked these two companies, experts, and Mac developers who have survived disasters for advice that could benefit small companies as well as large ones.



According to Comdisco, it takes three critical components to survive a disaster:

- A plan that highlights the people, equipment, and supplies that are essential to a company's function. A magazine like *Macworld*, for example, needs a way to prepare editorial copy, accept advertising for upcoming issues, and deliver editorial and advertising material to a printer. A sales-driven manufacturing company, on the other hand, needs to consider how it could continue to accept orders, build products, and deliver merchandise. After the earthquake, Dataproducts was able to function by temporarily shifting sales activity to field offices outside L.A.
- A place where a company can continue conducting its business. That might be a regional office, employees' homes, or another business that is willing to offer aid in the case of disaster. Some companies, for example, make mutual-aid agreements to share office space and equipment in case of emergency.
- The information that supports the company's business. Employee phone lists, supplier contacts, outstanding orders—anything and everything critical to maintaining the company, on disk or on paper, needs to be identified and accessible. Remember that a lot of vital information lives outside networks on the hard drives of individual employees.

HSC's Experience

Many small companies don't have disaster-recovery plans, but HSC Software had most of the bases covered after the shaking stopped in Southern California. As part of its disaster plan, the Santa Monica–based developer of Kai's Power Tools requires that its staff have home access to online services. All HSC employees have computers and modems at home, along with accounts on America Online and AppleLink, according to HSC chairman and CEO John Wilczak. As a result, HSC employees knew how to respond in the wake of the earthquake.

Thanks to functioning local phone lines, HSC could operate in cyberspace. Wilczak established a live private chat room within HSC's AOL forum for real-time business communications among staffers. Because he (and other managers) keep a list at home of HSC's 50 employees and their online accounts, Wilczak could send messages within a few hours of

continues



the earthquake asking all employees to work via AOL. "I did file sharing with about 20 people," says Wilczak.

Critical business information was also available to HSC shortly after the quake, thanks to rigorous backup procedures. "All of our machines get backed up every night, whether it is marketing, accounting, or code," says Wilczak. HSC uses an 18-gigabyte DAT drive for data backup, and individual employees are held responsible for this critical task. "It's the kind of thing that's taken very seriously in the company," says Wilczak. "This is your work. If you don't back up and it's lost, it's very serious." Every day one backup tape goes into a bank safety-deposit box for security; HSC's technical-services director keeps a duplicate tape off-site.

Checklist for Action

To protect your company and its business, you need to develop a plan, test it, and update it as the company grows or changes. Testing is critical; give yourself time before a disaster occurs to discover if your backup media is unreliable or time allotted for restoring a network is unrealistic. And if you undergo an emergency, apply what you learn to your disaster plan.

Dataproducts, for example, lost equipment and engineering documents to water damage from a sprinkler system that broke in the quake. Now the company plans to put engineering drawings away in a waterproof, fireproof container at the end of each day.

Working Software, a Macintosh developer in Santa Cruz, California, survived Northern California's 1989 Loma Prieta earthquake relatively unscathed. Still, the company learned several lessons. Company president Dave Johnson recommends placing rubber mats between Macs and desks so the machines won't slide off during tremors, and showing employees emergency exits (and giving them flashlights to find them should the electricity go out). Johnson also suggests stashing an inexpensive, standard phone somewhere in the office. Working Software's phone system needs electricity to function; the earthquake knocked out the region's power, but a standard home phone would have let him receive calls and call out.

Creating a disaster plan won't work unless you follow through. Disseminate the plan. Safeguard your critical business information. Share the disaster plan with employees. Make sure that your staff knows where to meet and what to do in case of emergency. Ask key managers to keep backup copies of the disaster plan at home; keep another copy in a bank's safety-deposit box or another secure place off-site.

And if you do nothing else to protect your company, keep your Macs backed up (see *Working Smart*, April 1994, for tips). Maintain at least two sets of backup data, and store one off-site in a safety-deposit box or another secure place.

"Don't wait," advises Wilczak. "You never know when disaster is going to hit or why." **m**

SERVICE HERO

Speaking of disasters, Amir Yavari of Microtek Lab made a lasting impression on two readers in Ames, Iowa, despite difficult conditions. Kurt Plagge and David Sauke write in praise of Yavari and Microtek for service in the aftermath of January's earthquake in Southern California. Plagge called Microtek, in Redondo Beach, California, for advice on a malfunctioning scanner two days after the earthquake and was sure he wouldn't hear from the company for weeks. Instead, the next day, Yavari "diagnosed our problem, sent the needed parts in overnight mail, and got our scanner up and running in less than three days despite definite distractions beyond his control," writes Plagge. "He told me on the phone that about half the employees at his location weren't able to make it to work yet. We were definitely impressed, [and] relieved to have our scanner working again."

Shreekrishna Datye of Iceland writes of the "exemplary post-sales service" Kent Marsh provides. The reader commends Kent Marsh for responding promptly when Datye discovered that the universal version of FolderBolt did not work with Icelandic System 7. The company made the program compatible with that system and sent Datye the latest program at no charge. "As a foreign customer," writes Datye, "I have never experienced better service from any other American software company."

Send nominees for sainthood to Service Heroes, *Macworld*, 501 Second St., San Francisco, CA 94107, or via Internet (Branscum@AOL.com). Conversely, drop *Conspicuous Consumer* a line if a company is ignoring you.

Buying Our New Scanner Is Like Traveling First Class On An Economy Ticket.



Agfa Introduces StudioScan.™ So Much Scanner For So Little Money.

It used to be that unless you had a lot of money to spend, a scanner was simply out of the picture. But now there's Agfa StudioScan, the new feature-rich scanner that's wonderfully affordable.

StudioScan offers the speed and efficiency of one-pass scanning for both black-and-white and color images. Its flatbed design accommodates sizes up to 8.5″ x 14″, and an optional transparency module scans 35mm slides up to 8″ x 10″.

What's more, StudioScan comes with a complete software package, including Agfa's proven labor-saving FotoLook,™ FotoTune LE,™ FotoSnap™ programs, and Adobe PhotoShop LE. Compatible with both Macintosh and PC systems, StudioScan actually guides an entry-level user through the entire scanning process.

To find out more about StudioScan's high-quality imaging for your layouts, in-house publications, illustrated reports, and more, call 1-800-685-4271 today. And discover the Agfa scanner that offers first-class features at an economy price.

AGFA Agfa

The complete picture.

Agfa and the Agfa-rhombus are registered trademarks of Agfa-Gevaert AG, Germany. StudioScan, FotoLook, FotoSnap, and FotoTune LE are trademarks of Agfa-Gevaert N.V., Belgium. Adobe and Adobe PhotoShop LE are trademarks of Adobe, Inc. Macintosh is a registered trademark of Apple Computer, Inc.

Circle 158 on reader service card

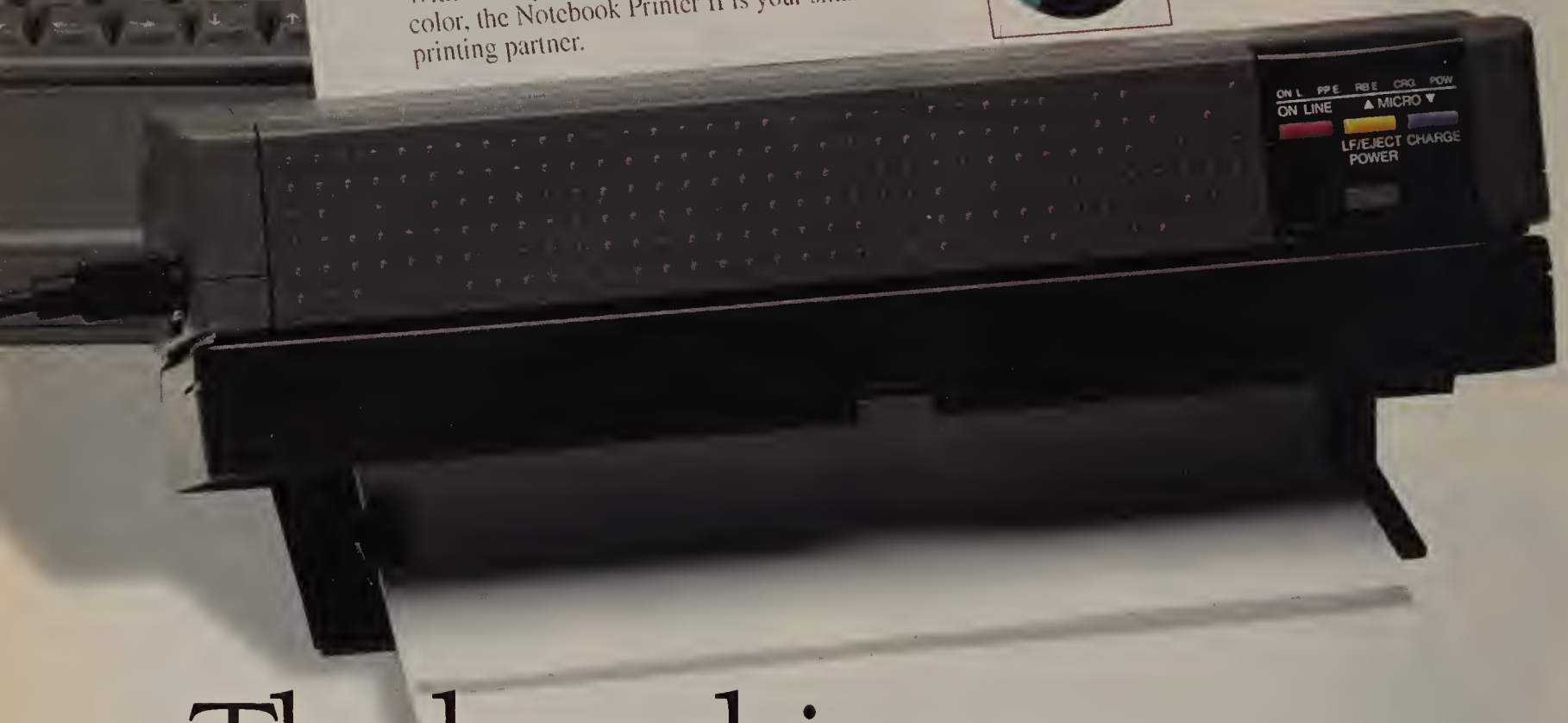
CITIZEN

Your PowerBook Printing Partner.

At home, at the office, or on the road, the Citizen Notebook Printer II works where you work.

With laser-quality text, graphics, and special-image color, the Notebook Printer II is your small-business printing partner.





The best thing next to the Macintosh.

When we say Citizen works where you work, we mean it. On your desktop or on the road, the Notebook Printer II™ is the perfect companion to your Macintosh®. With its built-in, 5-page sheet feeder or optional 30-page sheet feeder and NiCad battery, you'll get laser-quality text and graphics wherever your work takes you. You'll also get two pages per minute output and Special-Image Color. All for a surprisingly low price.



It's a great printer... it's compact, reliable and the output looks as good as an expensive laser.

Think of it. Now you can use your printer at your desk or in just about any location, use color when you need it, and produce professional-looking results. The Notebook Printer II really is the perfect plug and play companion to your Macintosh. And all Citizen printers come with Citizen's two-year warranty and exclusive Service Select Program.™ For information on the printer that works where you work, call 1-800-4-PRINTERS for a Citizen Notebook Printer II dealer near you.

CITIZEN™

The Notebook Printer II. It works where you work.

BUILT FOR THE MACINTOSH

©1993 Citizen America Corporation. Citizen America Corporation, Citizen logo, The Citizen Notebook Printer II and Special Image Color are registered trademarks of Citizen America Corporation. All other trademarks are the property of their respective owners. Printer shown with optional 30-page sheet feeder.

Circle 185 on reader service card

Editors' Choice

THE BEST PRODUCTS FEATURED IN MACWORLD

Edited by Susan Grant-Marsh

Macworld Editors' Choice is a complete listing of the hardware and software products selected as the best of their type in *Macworld*'s comparative articles. A ✣ next to a product indicates that we chose more than one product in that category.

Hardware

MONITORS

BLACK-AND-WHITE MONITORS, May 93
Portrait monitor: 15-Inch Gray Scale Portrait Display; Mirror Technologies, 612/633-4450; $399, with video-display board $549.
Two-page monitor: ✣ L-View MultiMode; Sigma Designs, 510/770-0100; $1099, with video-display board $1398. ✣ MD 202 Two Page Display; Mobius Technologies, 510/654-0556; $699, with video-display board $798.

COLOR MONITORS, Oct 93
16- and 17-inch: ✣ ErgoView 17; Sigma Designs, 510/770-0100; $1349.
✣ MultiSync 5FG; NEC Technologies, 708/860-9500; $1355 (NEC's estimated dealer price).

GRAY-SCALE MONITORS, May 93
Portrait monitor: Pivot Display; Radius, 408/434-1010; $849, with video-display board $1148.
Two-page monitor: MultiMode 120, SilverView Pro; Sigma Designs, 510/770-0100; $1099, with video-display board $1299.

SMALL COLOR MONITORS, Jan 94
14-inch display: ✣ Sony CPD 1430; Sony Corp. of America, 800/222-7669; $779.95. ✣ Nanao FlexScan F340i•W; Nanao USA, 800/800-5202; $799.
15-inch display: NEC MultiSync 4FGe; NEC Technologies, 708/860-9500; estimated street price $755.

NETWORK HARDWARE

HARDWARE ROUTERS, Jul 93
Under $1500: EtherRoute; Compatible Systems, 303/444-9532; base model $1495 (no TCP/IP support).
Between $1500 and $3500: InterRoute/5; Farallon Computing, 510/814-5000; $3299 to $3499.

HIGH-SPEED FAX MODEMS, Oct 93
Teleport Gold and Silver with Global Fax; Global Village Communication, 415/390-8200; Gold $499, Silver $429.

POWERBOOK TOOLS

DUO DOCKING CONNECTORS, Feb 93
PowerLink DeskNet; E-Machines, 503/646-6699; $699.

EXTERNAL HARD DRIVES, Feb 93
✣ Companion 120; APS Technologies, 800/874-1428; $599. ✣ PocketDrive 120M8; La Cie, 503/520-9000; $699.

INTERNAL FAX MODEMS, Feb 93
✣ PowerModem series; PSI, 408/559-8544; $195 to $495. ✣ PowerPort series; Global Village Communication, 415/390-8200; $229 to $499.

PRINTERS

COLOR PRINTERS, May 93
Dye-sublimation: ✣ ColorStream/DS; Mitsubishi International, 408/980-1100; $9950. ✣ Phaser IISD Color Printer; Tektronix, 503/682-7377; $9995.
Thermal-wax: ✣ ColorScript 210; QMS, 205/633-4300; $4995. ✣ Personal ColorPoint PSE; Seiko Instruments, 408/922-5800; $2999.
Low-end liquid-ink: HP DeskWriter 550C; Hewlett-Packard, 800/752-0900; $719.
Midrange liquid-ink: HP PaintJet XL300; Hewlett-Packard, 800/752-0900; $2795.
Solid-ink: Phaser III PXi Color Printer; Tektronix, 503/685-3585; $9995.

PERSONAL PRINTERS, Sep 93
Ink-jet: StyleWriter II; Apple Computer, 408/996-1010; $359.
PostScript laser: TI microLaser Series; Texas Instruments, 512/250-6679; $1199 to $1599.
QuickDraw laser: LaserWriter Select 300; Apple Computer, 408/996-1010; $839.

WORKGROUP PRINTERS, Feb 94
High-speed: Hewlett-Packard 4Si MX; Hewlett-Packard, 800/752-0900; $5499.
Best buy: ✣ Apple LaserWriter Pro 630; Apple Computer, 408/996-1010; $2529.
✣ Hewlett-Packard LaserJet 4M; Hewlett-Packard, 800/752-0900; $2329.

SCANNERS

LOW-COST COLOR SCANNERS, Nov 93
$1300 to $1600: ✣ La Cie Silverscanner II; La Cie, 503/520-9000; $1599.
✣ Hewlett-Packard ScanJet IIc; Hewlett-Packard, 800/752-0900; $1599.
Under $1300: Mirror 800 Plus Color Scanner; Mirror Technologies, 612/633-4550; $1299.

OCR, Nov 93
OmniPage Professional; Caere Corp., 408/395-7000; $995.

SYSTEMS/STORAGE

DOUBLE-SPEED CD-ROM DRIVES, Jul 93
Sheer speed: Pioneer DRM-604X; Pioneer, 408/988-1702; $1795.
Overall value: AppleCD 300; Apple Computer, 408/996-1010; $599.
Budget choice: NEC MultiSpin 38; NEC Technologies, 708/860-9500; $465.

HIGH-SPEED HARD DRIVES, Aug 93
2.7GB drives: ✣ Nova XL 2700; Microtech International, 203/468-6223; $2999. ✣ Vista 3.5GB; Relax Technology, 510/471-6112; $3499.
SCSI-2 adapter: QuickSCSI; PLI, 800/288-8754; $499.

MACINTOSH UPGRADES, Jun 93
SE accelerator (25MHz): Quik30; Novy Systems, 904/427-2358; $449 (without FPU).
SE/30 accelerator (50MHz or 33MHz): Universal PowerCache; DayStar Digital, 404/967-2077; 50MHz $999 (with FPU), 33MHz $449 (without FPU).
LC and LC II upgrades: Macintosh LC III Logic Board Upgrade; Apple Computer, 408/996-1010; $599.
Mac II accelerators: ✣ Radius Rocket 25i, Radius Rocket 33; Radius, 408/434-1010; 25i $1199, 33 $2499.
✣ Universal PowerCache series; DayStar Digital, 404/967-2077; $449 to $999.
IIfx SCSI accelerator: QuickSCSI; PLI, 800/288-8754; $499.
Quadra static-RAM cache card: FastCache Quadra; DayStar Digital, 404/967-2077; $299 for Quadra 700 and 900, $449 for Quadra 800 and 950.

MIDRANGE HARD DRIVES, Mar 93
Low-capacity drive: La Cie Cirrus 240; La Cie, 503/520-9000; $769.
Notable technology: DiamondDrive 510; Mass Microsystems, 408/522-1200; $2089.
Bargain: APS Fujitsu 520; APS Technologies, 800/874-1428; $1149.
All-around quality: hammer 525FMF; FWB, 415/474-8055; $2799.

OPTICAL DRIVES, Dec 93
3½-inch: ✣ Epson OMD 5010; ClubMac, 800/258-2622; $959.
continues

MACWORLD Editors' Choice

✣ 128 MO; APS Technologies, 800/874-1428; $899.
5¼-inch: ✣ Sharp JY-750; ClubMac, 800/258-2622; $1829.
✣ Infinity MaxOptical 11m; Peripheral Land Inc., 800/288-8754; $4113.

VIDEO/DISPLAY

24-BIT VIDEO CARDS, Apr 94
Inexpensive acceleration: PrecisionColorPro 24XP; Radius, 408/434-1010, $599.
Full-featured acceleration: Thunder II GX•1360; SuperMac Technology, 408/541-6100; $4499.

HIGH-END VIDEO EDITING, June 94
Presentation Video: ✣ MoviePak2 Pro Suite; RasterOps, 801/785-5750; $4199. ✣ VideoVision Studio; Radius, 408/434-1010; $4499.
Corporate Video (Offline): Media Composer 400s; Avid Technology, 508/640-6789; $14,995.
Corporate Video (Online): VideoCube; ImMix, 916/272-9800; $40,500.

PHOTOSHOP ACCELERATORS, Apr 94
PhotoBooster; Radius, 408/434-1010; $999.

Software

ACCOUNTING/FINANCE

GROWING A SMALL BUSINESS, Nov 93
Small-business system: M.Y.O.8.; Teleware, 201/586-2200; $199.
Home office/personal finance: MacMoney; Survivor Software, 310/410-9527; $119.95.

BUSINESS TOOLS

STATISTICS, Oct 93
Exploratory data analysis: DataDesk 4.1; Data Description, 607/257-1000; $595.
Comprehensive package: SYSTAT 5.2.1; SYSTAT, 708/864-5670; $895.

CD-ROM

TOP 10 CD-ROMS, Mar 94
Overall: Seven Days in August; Time Warner Interactive Group, 818/955-9999; $79.99.

COMMUNICATIONS/NETWORKS

HIGH-SPEED FAX MODEM SOFTWARE, Oct 93
Faxstf; Telefocus, 816/886-9800; $79.

NETWARE CONNECTIVITY, Sep 93
NetWare for Macintosh; Novell, 801/429-7000; $495 for 5-user license to $2295 for 200-user license.

SOFTWARE ROUTER, Jul 93
Apple Internet Router 3.0; Apple Computer, 408/996-1010; Basic Connectivity Package $499.

TERMINAL EMULATOR, Oct 93
VersaTerm; Synergy Software, 215/779-0522; $149.

GRAPHICS

2-D CAD, Jan 93
Low-end: BluePrint; Graphsoft, 410/461-9488; $295.
Midrange: PowerDraw; Engineered Software, 919/299-4843; $795.

3-D DESIGN, Aug 93
Price for performance: ✣ Ray Dream Designer 2.0.4; Ray Dream, 415/960-0765; $299. ✣ Alias Sketch 1.5; Alias Research, 416/362-9181; $995.
All-in-one solution: ✣ Infini-D 2.5; Specular International, 413/253-3100; $695. ✣ StrataVision 3D 2.6.1; Strata, 801/628-5218; $995.

CLIP ART'S GREATEST HITS, Jan 94
Overall collection: ✣ ClickArt Studio Series; T/Maker Company, 415/962-0195; $99.95 per volume. ✣ Electronic Clipper subscription service; Dynamic Graphics, 800/255-8800; $67.50 per month. ✣ Metro Image8ase Electronic Clip Art; Metro Image8ase, 800/525-1552; $74.95 per volume, CD-ROM $149.95. ✣ Images with Impact series; 3G Graphics, 800/456-0234; $99.95 to $129.95 per volume, CD-ROM $499. ✣ Typographers' Ornaments; Underground Grammarian, 609/589-6477; $25 per volume; ten TIFF albums $200; EPS volumes $50 each.

DRAW PROGRAMS (LOW-COST), Sep 93
Budget draw: Expert Draw; Expert Software, 305/567-9990; $49.95.
Budget draw/paint: UltraPaint; Deneba Software, 305/596-5644; $79.
Beginners' program: Aldus SuperPaint; Aldus Corp., 619/558-6000; $149.95.
Overall: Canvas; Deneba Software, 305/596-5644; $399.

FONT BUYERS' GUIDE, Mar 94
Text-face collection: Type On Call CD-ROM; Adobe Systems, 415/961-4400, 800/682-3623; $99 (includes the ability to unlock two families from preselected packages) plus $25 to unlock individual faces or $69 to $179 for unlocking families.
Display/decorative-face collection: Fontek; Letraset, 201/845-6100; $39.95 per face.
Bargain collection: Monotype ValuePack; Monotype, 312/855-1440; $89 for 57 fonts.

IMAGE DATABASES, Oct 93
✣ Aldus Fetch 1.0; Aldus Corp., 206/628-5739; $295.
✣ Multi-Ad Search 2.0; Multi-Ad Services, 309/692-1530; $249.

Vendors: Please write to Macworld Editors' Choice, 501 Second St., San Francisco, CA 94107, or send a fax to 415/442-0766 to inform us of changes in your phone number or your product's list price.

PAINT AND IMAGE-EDITING, Sep 93
Budget buy: Expert Color Paint; Expert Software, 305/567-9990; $49.95.
Overall program: Fractal Design Painter; Fractal Design Corp., 408/688-8800; $399.
Image-editing program: Adobe Photoshop 2.5.1; Adobe Systems, 415/961-4400; $895.

INTEGRATED SOFTWARE

INTEGRATED SOFTWARE, Feb 94
ClarisWorks; Claris Corporation, 408/727-8227; $299.

ORGANIZATION/PRODUCTIVITY

CALENDARS, Jul 93
Alarm system: ✣ First Things First; Visionary Software, 503/246-6200; $79.95.
✣ Smart Alarms Plus; JAM Software, 203/630-0055; $75.
All-around scheduler: Now Up-to-Date; Now Software, 503/274-2800; $99.
Meeting scheduler: Meeting Maker; On Technology, 617/374-1400; five-pack $495.

SALES-AUTOMATION SOFTWARE, Oct 93
✣ Contact Ease; WestWare, 619/274-5053; one user $395, five users $1495.
✣ CBS; Colleague Business Software, 512/345-9964; $495.

TEXT-RETRIEVAL SOFTWARE, Dec 93
Small system: On Location; On Technology, 617/374-1400; $129.
Multiuser system: Personal Librarian; Personal Library Software, 301/990-1155; $995.

PRESENTATION TOOLS

MULTIMEDIA AUTHORING, Mar 93
Entry-level: ✣ Action; Macromedia, 415/252-2000; $495.
✣ Passport Producer; Passport Designs, 415/726-0280; $495.

UTILITIES

BRAVE NEW DOCUMENTS, Jan 94
Application-independent document distribution: Common Ground; No Hands Software, 800/598-3821; $189.95.
Book-length documents: FrameReader; Frame Technology, 800/843-7263; $84.95.

PRINTING, Sep 93
PC-printer cable packages: PowerPrint; GDT Softworks, 604/291-9121; $149.

VIRTUAL MEMORY SOFTWARE

VIRTUAL MEMORY, June 94
Virtual memory Software: Virtual 3.0; Connectix Corp., 415/571-5100; $99.
Memory Boosting Software: RAM Doubler 1.0.1; Connectix Corp., 415/571-5100; $99. m

Star Ratings

OVER 300 HARDWARE AND SOFTWARE REVIEWS AT A GLANCE

Edited by Wendy Sharp

Macworld Star Ratings lets you compare hardware and software products for the Macintosh by providing summaries of hundreds of *Macworld*'s authoritative product reviews. The number of stars at the beginning of each capsule review indicates quality; our reviewers assign five stars to outstanding products and one star to poor ones.

If a product has been upgraded since our last review, the most recent version number supplied by the vendor appears in parentheses after the reviewed version number. To read a full review of any product in the listing, please consult the issue listed at the end of each synopsis.

Vendors: Please write to *Macworld Star Ratings*, 501 Second St., San Francisco, CA 94107, to inform us of changes in the version number or list price of your product, or of changes to your phone number.

Software

BUSINESS TOOLS

★★★ **4D First 1.0, ACI US, 408/252-4444, $295.** This entry-level relational database is a low-cost way to distribute the power of 4D and 4D Server to an office full of Macs. It's not much easier to use, however, than the full-fledged 4D. May 94

★★★ **4D Server 1.0.1 (1.0.5), ACI US, 408/252-4444, $1495 to $3495.** Database server uses the ingenious multitasking technology built into 4D to make it appear that each client has the full resources of the server. If you use 4D on a network, you need this product. Jun 93

★★★ **Acrobat Exchange, Acrobat Distiller, Adobe Systems, 415/961-4400, $195 to $2495.** Complete, well-planned paperless office system creates application-independent viewable files that can be readily distributed on a network. Still, it's not yet as inexpensive or as convenient as you might wish. Oct 93

★★★ **@Risk 1.1, Palisade Corp., 607/277-8000, $395.** Statistical simulator for Microsoft Excel financial computations generates complex, statistically valid templates within Excel and is the first choice for analysts who work with probabilistic models every day. It assumes that the user is an Excel power user. Aug 93

★★ **BaseMap 1.0.1, GeoPoint, 415/957-1560, $149.** For simple maps displaying simple data, this mapmaking tool may be useful. It's not for the cartographic sophisticate, however, as it offers very limited data-display abilities and only one projection. May 94

★★★★ **ClarisWorks 2.0, Claris Corp., 408/727-8227, $299.** Integrated program provides more features, is easier to use and faster, and has better integration among modules than other available programs. Aug 93

★★★★ **Common Ground 1.0, No Hands Software, 415/802-5800, $189.95.** Simple, robust document-interchange system is the clear choice for modest document-distribution jobs. In tests, it worked easily with documents from many different applications. Oct 93

★★★ **Cricket Graph III 1.5, Computer Associates International, 516/342-6000, $129.** Basic and foolproof charting program produces cleaner charts than Excel with little effort, although its feature set is fairly modest. Apr 94

★★★★ **DeltaGraph Pro 3, DeltaPoint, 408/648-4000, $195.** At its new lower price, this charting program is the best feature-for-feature value in Macintosh charting. There's even a new Chart Advisor function that suggests the appropriate display for your data. Apr 94

★★ **EasyFlow 1.1, HavenTree Software, 613/544-6035, $229.** The rough edges and distinctly un-Mac-like attributes of this flowcharting software reflect its DOS heritage, but on the whole it's easy to use. Sep 93

★★★ **Helix Express 1.0 (2.0), Helix Technologies, 708/465-0242, $439.** This relational database has an iconic programming language that sometimes baffles programmers, but provides an easy route into basic data-handling for nonprogrammers. Jul 93

★★★ **Helix Tracker 1.0, Helix Technologies, 708/465-0242, $439.** Well-designed workgroup-document manager has strong audit and annotation features; imposes just the right amount of administrative discipline. For large documents, however, Ethernet will look mighty attractive. Nov 93

★★★ **ithink 2.2.1, High Performance Systems, 603/643-9636, $695.** Although it requires a real training commitment for effective use, this product is an attractive dynamic business-modeling system. It's a good bet for identifying cloudy spots in the crystal ball. May 93

★★ **Lotus Notes 3.0, Lotus Development Corp., 617/577-8500, $495 per client.** Well-organized, robust, and flexible business data system demands a full-time administrator, preferably with considerable programming experience, for effective use. Sep 93

★★★ **MacBarcoda 2.2.4, ComputaLabel, 508/462-0993, $349 to $895.** Simple-to-use desk accessory creates bar codes in EPS or Adobe Illustrator 1.1 format. DA cannot automatically create serial codes. Jun 93

★★★ **MacProject Pro 1.0 (1.5), Claris Corp., 408/727-8227, $599.** If you're working on a midsize project and like using PERT charts, this may be the project-management software for you. However, the multistep scheduling process and the limited integration between charts are frustrating if you prefer Gantt charts. May 93

★★★ **Map II 1.5, Think Space, 519/661-4006, $395.** Well-structured program has most of the functions a simple geographical information system needs and is suitable for introductory instruction in GIS and for alert first-time users who just like maps. May 94

★★★★ **MarcoPolo 2.0, Mainstay, 805/484-9400, $395.** Inexpensive, easy-to-use product allows you or your workgroup to archive and retrieve documents, whether in electronic or paper form. Queries are easy to construct and searches are handled quickly. Sep 93

★★★ **Market Master Manager 3.5, Breakthrough Productions, 916/265-0911, $395 to $1995.** Sales-automation software is designed to keep track of contacts, generate mailings, and make sure that leads don't fall through the cracks. It includes a remote module, but it has some odd user-interface features. Oct 93

★★ **Memorizer 2.0, Brains Software Engineering, 432-231-28973 (Austria), $100.** Software records dictation, and you transcribe the dictation in a word processor. You may prefer to stick with a hand-held tape recorder, considering the product's RAM and storage appetite and its propensity to crash. Aug 93

★★★ **Micro Planner Manager 1.1, Micro Planning International, 303/757-2216, $695.** When you require cross-project resource sharing and leveling for a reasonable price, this project-management software has the edge. It has a generally intuitive interface, though there's a steep learning curve for its advanced features. Nov 93

★★★★ **Microsoft FoxPro for Macintosh 2.5, Microsoft Corp., 206/882-8080, $495.** Dazzlingly fast and easy to use relational database has a greatly improved interface and cross-platform compatibility. For projects of 4 to 20 users that handle large amounts of data (hundreds of thousands to millions of records) it offers excellent performance. Apr 94

★★★ **Office Tracker 1.1, Milum Corp., 512/327-2255, $195 to $995.** The efficient user interface of this software sign-out board, in both single-user and networkable versions, makes it easy to learn and use; but it has some minor flaws. Dec 93

★★★★ **Project Scheduler 5, Scitor Corp., 415/570-7700, $695.** For most midrange project-planning, this program's many hits outweigh its few misses. It goes beyond the requisite scheduling options, with inflation factors and unlimited projects in memory, and it conforms to accepted standards, so you get consistent, predictable results. Aug 93

★★★ **SpreadBase 1.0.1, Objective Software, 415/306-7410, $695.** Business data-analysis tool is a unique combination of database and spreadsheet functions. It's worth a close look for power users, despite meager documentation and a cranky macro language. May 93

★★ **Useful Voice Processor for Macintosh 1.1v7 (1.1v9), Useful Software Corp., 508/774-8233, $179.95.** Dictation software lets you record and transcribe on a Mac. It has some useful features, but you must take uncommon care to avoid crashes. Dec 93

continues

Star Ratings

★★★ **Wingz 1.1ae, Informix Software, 913/599-7100, $399.** Low-overhead spreadsheet offers advanced-math functionality, a competent calculating engine and superior charts; but is missing outlining, real 3-D spreadsheet linking, and the host of third-party add-ons offered for Microsoft Excel. Jul 93

★★★ **WordPerfect Works 1.2, WordPerfect Corp., 801/225-5000, $249.** This program offers seven well-integrated and flexible modules. It has a few shortcomings, including some memory-management problems, but buyers should generally be pleased. Jun 93

COMMUNICATIONS/NETWORKS

★★ **AccessPC 3.0, Insignia Solutions, 415/694-7600, $129.95.** Utility translates most word-processor and some database formats, but it doesn't translate graphics and some of its translations result in data loss. Apr 94

★★★ **Crosstalk for Macintosh 2.0, Digital Communications Associates, 404/442-4000, $195.** Commendable communications product has a feature set that well matches its competition. Still, the script editing is complex and you must manually enter phone numbers each time you use it. Apr 94

★★★ **Delrina FaxPro for Macintosh 1.0, Delrina Corp., 408/363-2345, $129.** Fast, efficient fax software has an excellent address-book feature but also has some interface quirks and minor bugs. Feb 94

★★★★ **DO5 Mounter Plus 4.0, Dayna Communications, 801/269-7200, $100.** File-transfer and translation utility works with floppies, removable drives, and network volumes and supports wild cards in DOS extensions. Apr 94

★★★★ **EtherPeek 2.0.3, LocalPeek 2.0.3, TokenPeek 1.0 (2.0.3), AG Group, 510/937-7900, $495 to $995.** Priced at a fraction of the cost of dedicated hardware analyzers, these network analyzer tools give you better analysis with a friendlier interface. They're a worthwhile investment. Jan 94

★★★★ **MacLink Plus/Translators Pro 7.5, DataViz, 203/268-0030, $149.** If your PC files are in archaic formats, you'll need this file-transfer and translation utility. It's a great option for most users, but it doesn't support removable drives or network volumes. Apr 94

★★★ **On The Air 1.0.1 (1.0.2), Digital Eclipse Software, 510/547-6101, $79.99 to $639.99.** Intercom system transmits System 7 SND resources, SoundEdit, and AIFF sound files across a network. It's well designed and performs decently, but its usefulness seems limited. Aug 93

★★★ **On The Road 1.1, Connectix, 415/571-5100, $99.** Helpful PowerBook utility looks at what's hooked up to your computer and adjusts accordingly—for example, printing when a printer is available and otherwise deferring printing. It only supports some hardware, however, so check before buying. Dec 93

★★★★ **Silver Cloud 1.2, AG Group, 510/937-7900, $495.** If you are administrating a large network and are drowning in a sea of devices and zones, this network-management software will make your life simpler. Feb 94

★★★ **SITcomm 1.0, Aladdin Systems, 408/761-6200, $120.** Inexpensive telecommunications software is fairly easy to set up and use, and will do well for people who use just one or two online services. Still, it lacks true scripting and has limited protocol options. Apr 94

★★ **SoftPC 3.1, Insignia Solutions, 415/694-7600, $499.** While the speed of this Windows PC emulator is greatly improved, buying an add-in PC card for your Mac is more efficient. Mar 94

★★★★ **Timbuktu Pro, Farallon Computing, 510/814-5000, $199 to $1999.** Terminal-emulation product is a must-have for in-house technical-support staff and for people who need direct connection to computer systems on a variety of networks. The major enhancements of this version are TCP/IP support for Macs and noticeably faster screen redraw. May 94

★★★★ **VersaTerm 5.0, Synergy Software, 215/779-0522, $195.** The price and feature set of this network terminal-emulation package make it a terrific value, in spite of its complex documentation and limitations. If you're looking for a fast path to Internet connectivity, this is it. Jan 94

DESKTOP PUBLISHING

★ **AboutFace 1.1.1 (1.1.2), Big Rock Software, 716/288-2860, $69.95.** Type-specimen generator has many serious deficiencies that need to be addressed. Jan 94

★★★★ **Aldus Fetch 1.0, Aldus Corp., 206/622-5500, $295.** The rich feature set and network support of this image-cataloging software make it a clear winner. Although cataloging is slow, users have fine control of the depth and compression of thumbnails. Aug 93

★★★★ **Aldus PageMaker 5.0, Aldus Corp., 206/622-5500, $895.** Desktop publishing software has added the features, both great and small, that it's been lacking, while still retaining the ease-of-use advantages that it's always had. This is a superb upgrade. Nov 93

★★★ **Cumulus 1.1 (1.2), Canto Software, 415/431-6871, $295 to $895.** Good network support, plus a feature that creates a protocol file for recording user actions, make this image-cataloging program a good choice for workgroups. It doesn't have an image-preview feature, nor does it offer 32-bit thumbnails. Aug 93

★★★ **Expanded Book Toolkit 1.0.1 (2.1), The Voyager Company, 310/451-1383, $295.** Using this hypermedia publishing program, average mortals can create highly functional multimedia books in a fraction of the time it would take to do the job unassisted. Be aware, though, that it's no QuarkXPress. Jun 93

★★★★ **FontMonger 1.5.7, Ares Software Corp., 415/578-9090, $149.95.** Font-conversion utility provides cross-platform, cross-font conversion and makes it easy to create composite, subscript, superscript, and rotated characters. Sep 93

★★ **FotoTune 1.1, Agfa Division of Miles, 508/658-5600, $795.** Color-management software has a capable engine, but it's not the complete color management system Agfa touts. Invisible tech support and poor documentation were only part of the problem. Apr 94

★★★★ **FrameMaker 4.0, Frame Technology Corp., 408/433-3311, $895.** For such projects as long, structured documents—books, instruction manuals, and textbooks—this desktop publishing program is one of the best tools available. It's fast, well mannered, and a real time-saver. Mar 94

★★ **ImageAccess 1.0, Nikon, 516/547-4355, $495.** This expensive image-cataloging program has an unusual interface and cannot be used over a network. A plug-in module provides direct support for Nikon's LS-3510AF film scanner. Aug 93

★★★ **Kodak ColorSense 1.0, Eastman Kodak, 716/253-0740, $499.** Color-management system gives average users access to a reasonable level of color consistency at a reasonable price. It does not make color separations. Oct 93

★★ **Kudo Image Browser 1.0 (1.1), Imspace Systems Corp., 619/272-2600, $195.** This image-cataloging software cannot control thumbnail depth or compression and doesn't have a keyword feature or allow multiple users to access the catalog simultaneously. The unique Riffle feature lets you quickly scan images. Aug 93

★★★★ **Print Shop Deluxe, Broderbund Software, 415/382-4400, $50.** Even the most ham-fingered can create professional-looking greeting cards, signs, banners, letterhead stationery and calendars with these desktop publishing templates and graphics. While it's not a substitute for a high-end program, it is easy to use and inexpensive. Apr 94

★★★★ **QuarkXPress 3.2, Quark, 303/894-8888, $895.** This upgrade adds the EfiColor XTension to ensure the greatest possible fidelity of color images and is a must-have for professional color publishers who use Quark. For others, the enhancements are welcome but minor enough that they provide little incentive to upgrade. Nov 93

★★★★ **SuperATM, Adobe Systems, 415/961-4400, $149.** This upgrade to Adobe Type Manager lets you view Adobe-brand PostScript fonts on screen and output them at high resolutions, even when the corresponding printer fonts are unavailable. Although it has limitations, this is an outstanding advance in font technology and a tremendous value. May 93

★★★★ **Tableworks Plus 1.05, Npath, 206/392-7745, $299.** Publishing utility adds a full table-editor to QuarkXPress and is a must-have for anyone doing even mildly complex tables. Jan 94

EDUCATION

★★★★ **Decimal & Fraction Maze 1.2 (1.2.3), Great Wave Software, 408/438-1990, $69.95 to $89.95.** Education software weaves the threads of eight math curricula—from third grade to eighth, along with two levels of adult education—into an interesting and visually stimulating game. Jul 93

★★ **Dvorak on Typing 1.0, MacPlay, 714/553-3530, $49.95.** Typing tutor offers solid lessons, but the small annoyances, such as never being able to take intermediate or advanced lessons without first passing a test, add up. Jun 93

★★★★ **How Computers Work, Time Warner Interactive Group, 818/955-9999, $79.99.** Graceful, well-integrated CD-ROM tutorial guides the curious through brief but helpful explanations of basic computer technologies. Jan 94

★★★ **HyperStudio, Roger Wagner Publishing, 619/442-0522, $179.95.** Hypermedia authoring tool supports color and many multimedia functions through easy-to-use dialog boxes, but the interface doesn't always follow Apple guidelines. Dec 93

★★★ **MacGrade 1.5.5, CalEd Software, 800/795-0641, $85 to $245.** Grade-book program has a straightforward, simple interface and clear documentation. Although there's room for improvement, it's easy to use and flexible. Feb 94

★★★★ **Mavis Beacon Teaches Typing 2.0, The Software Toolworks, 415/883-3000, $49.95.** If being entertained while learning to type interests you, this typing tutor provides varied environments, interesting lessons, and good games. Jun 93

★★★ **Millie's Math House 1.0 (1.1), Edmark Corp., 206/556-8400, $49.95.** Math-education software provides ways for preschoolers to experiment with numbers and counting. It's engaging, but more advanced levels would keep children challenged longer. Jul 93

SAVE
ALMOST
50%
off the cover price

12 Issues for $24!

When you subscribe today

☐ Send me 1 year (12 monthly issues) of Macworld for $24. Save 20% off the basic subscription rate. Please bill me later.

☐ SAVE EVEN MORE! 2 years (24 monthly issues) for $39.97. Please bill me later.

Basic subscription price is $30 for 12 issues. The annual cover price is $3.95 per issue. For Mexican and Canadian subscriptions, please add $18 per year for shipping; $70 for all other foreign countries.

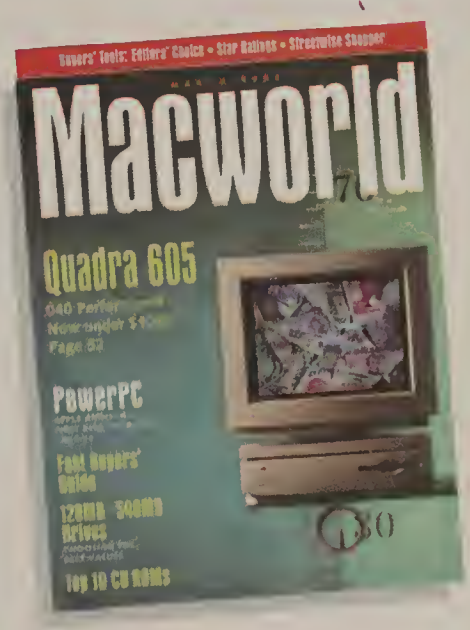
Name _____

Company _____

Address _____

City/State/Zip _____

Macworld



4CBM0

SAVE
ALMOST
50%
off the cover price

NO POSTAGE
NECESSARY
IF MAILED IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 1167 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

Macworld
SUBSCRIPTION DEPARTMENT
P.O. BOX 51666
BOULDER, CO 80321-1666

★★★★ **The Rosetta Stone, Fairfield Language Technologies, 703/432-6166, $395.** Foreign-language instruction on CD-ROM is a valuable educational tool and fun to use. The lessons are well paced, and the content is generally excellent and diverse. Jan 94

★★★ **The Secret Island of Dr. Quandary 1.0, MECC, 612/569-1500, $49.95.** Clever package of gorgeous landscapes, catchy sounds, and tempting arcade-game puzzles uses math, logic, and reading skills. Although slow, it's fun for parents and kids. Jun 93

★★★ **Stickybear's Reading Room 2.2a, Optimum Resource, 803/785-7441, $59.95.** Educational game with four activities takes a sedate but direct path to building primary-level reading skills. Jun 93

ENTERTAINMENT

★★★ **BlackJack Trainer, ConJelCo, 412/492-9210, $75.** Learn the strategies you need to win at blackjack with this program. There are a number of trivial bugs, but they won't get in the way. Oct 93

★★★ **Daily Sports Quiz 1.0, DreamTime, 619/236-1341, $49.95.** If you think you know a lot about sports and love to play trivia games, then this entertaining and informative game is for you. Oct 93

★★★★ **Falcon MC 1.0, Spectrum HoloByte, 510/522-1164, $69.95.** Whether you're an armchair jet jockey or an experienced fighter pilot, you're bound to be impressed by the 4-bit color, enhanced graphics, and sophistication of this latest incarnation of the original Macintosh combat flight simulator. Dec 93

★★★ **Hell Cab 1.0.1, Time Warner Interactive Group, 818/955-9999, $99.99.** Take a diabolical New York cabbie with a penchant for time travel, toss in the Empire State Building, add a few brainteasers, and you've got this engaging game on CD-ROM. It's slow and the arcade sections are hard to control, but overall it succeeds. Jan 94

★★★ **Indiana Jones and the Fate of Atlantis, LucasArts Games, 415/721-3394, $59.95.** In this game, the whip-wielding archaeologist goes looking for Atlantis and finds it armed to the gills with magical technology and Nazi stooges. If you're not bothered by the story's astonishing sexism, you'll find it diverting. Oct 93

★★★★ **Jewelbox 1.5 (2.0), Varcon Systems, 619/563-6700, $49.95.** This gem of a game is strongly reminiscent of Tetris. The jewels fall into rows that disappear when you place three jewels of a kind together. Jun 93

★★★ **The Journeyman Project 1.0 (1.2), Presto Studios, 619/689-4895, $79.95.** Interactive science-fiction epic on CD-ROM is a work of art. The scenes are rich with painstakingly detailed graphics, elaborate models, and subtle textures, but the sluggish pace may leave you impatient and bored. Sep 93

★★★★ **Maelstrom 1.03, Ambrosia, P.O. Box 23140, Rochester, NY 14692-3140, $15 plus $5 shipping and handling.** Fast-paced arcade game is loosely modeled after Asteroids, the Atari classic. Maelstrom features superb animation, hilarious sound effects, exciting action—and best of all, it's shareware. Jun 93

★★★★ **Myst 1.0, Brøderbund Software, 415/382-4400, $59.95.** The smooth pacing of actions and sounds in this beautiful CD-ROM game give it a dreamlike quality. This is a game that's been polished until it shines. Mar 94

★★★★ **Seven Days in August, Time Warner Interactive Group, 818/955-9999, $59.99.** Compelling, interactive documentary on CD-ROM cuts a slice from history and offers August 10 through August 16, 1961, (the building of the Berlin Wall) to viewers in a way that truly evokes the period. Oct 93

★★★★ **Spectre Supreme, Velocity Development, 415/274-8840, $69.95 to $89.95.** The pleasure of this game comes not in high scores, but in the almost addictive sense of control you get from moving your tank around the screen. It's so much fun that it's even fun when you lose. Dec 93

★★★ **V for Victory: Utah Beach, Three-Sixty Pacific, 408/879-9144, ext. 23, $69.95.** The post-D-Day conquest of Normandy is re-created in this game; its strength is the way it blends easy play with complicated strategy. Some bugs exist. Oct 93

FINANCE/ACCOUNTING

★★★★ **Andrew Tobias' TaxCut 1993, MECA Software, 203/255-1441, $79.95.** The free-form approach and flexible Help menus of this tax-preparation software make filling out your tax return a smooth, almost relaxing process. The only state versions available are California and New York. Apr 94

★★★★ **BestBooks 1.0, Teleware, 201/586-2200, $99.** In a straightforward, unintimidating manner, this small-business accounting program integrates the standard bookkeeping functions of accounts receivable, accounts payable, and general ledger. Jul 93

★★★ **ExpensePlus 1.0.1, State of the Art, 714/753-1222, $139.95 to $159.95.** Software uses a Newton MessagePad to record expenses, then sends the data to a Mac to create and print expense reports. While it's a real time-saver, you'll need AppleScript expertise to modify the expense reports. Apr 94

★★★★ **MacInTax 1993, ChipSoft, 602/295-3110, $69.95.** Tax-preparation software provides a reasonably detailed manual and a reliable, structured interface for building your tax return. Its inability to accept figures containing amounts in cents or round off to whole dollar amounts will frustrate some users. Apr 94

★★★ **MacInTax Tax Planner, ChipSoft, 602/295-3110, $19.95.** Software allows you to construct a five-year forecast of your tax liability, projecting tax figures through 1997 in a concise summary format. If you have a tax preparation program, you can do the same thing by creating alternative tax returns. Apr 94

★★★ **MacInTax Tax Savings Guide, ChipSoft, 602/295-3110, $19.95.** Simple, straightforward collection of well-written, fully indexed tax tips and suggestions is designed to help you better understand your tax return and reduce your tax liability. Although strong in content, it doesn't allow you to copy and paste, export as a text file, or even print. Apr 94

★★★★ **Quicken 4, Intuit, 415/858-6095, $69.95.** Personal-finance software is powerful and easy to learn, even for a financial neophyte. Although slower than previous versions, 4.0 lives up to its promise of making financial chores easier and better organized. Nov 93

GRAPHICS

★★★ **addDepth 1.0.2, Ray Dream, 415/960-0768, $179.** The purpose of this graphics program is to enhance the creation of 2-D images with 3-D effects. It's versatile, accommodating, and affordable, but working on complex images gets tedious because of the automatic application of styles. Aug 93

★★★★ **Adobe Illustrator 5.0, Adobe Systems, 415/961-4400, $595.** The Mac's most dependable draw program has added enough new features to boggle the mind. It still can't import TIFF images, but it catches up with, and in some areas surpasses, the competition. Nov 93

★★★★ **Adobe Photoshop 2.5 (2.51), Adobe Systems, 415/961-4400, $895.** No graphics program is as universally loved as this one, but while this upgrade builds on the program's capabilities, it ignores some minor weaknesses that have begun to peek through the product's armor. It's still great but perhaps not perfect. Jun 93

★★★★ **Aldus FreeHand 4.0, Aldus Corp., 206/622-5500, $595.** The new page-design and text-editing functions of this powerful draw program make it more than worth the price of admission. Aside from some bewildering interface elements, it's an outstanding program. Mar 94

★★★★ **Alias Sketch 1.5, Alias Research, 416/362-9181, $995.** The enhanced modeling and revamped rendering capabilities of this 3-D illustration program contribute to a tremendous and reliable upgrade, a heartening example of a company listening to its users. Jul 93

★★★ **artWorks 1.0 (1.01), Deneba Software, 305/596-5644, $149.** If you're expecting a graphics dynamo, this combination paint and draw program will leave you a little cold. Despite its flaws, it ranks as one of the best graphics programs available under $200. Jun 93

★★★★ **Blueprint 4, Graphsoft, 410/290-5114, $295.** Entry-level 2-D drafting program is a wonderful antidote to the complicated CAD system blues. Don't be misled by the low price; this full-fledged drafting package is powerful enough to serve professionals who appreciate the value of simplicity. Jul 93

★★ **BrushStrokes 1.0, Claris Clear Choice, 408/727-8227, $139.** If you have absolutely no experience with computer graphics, the simplified interface of this 24-bit paint program might warrant its price. Otherwise, you can find better programs for less. Oct 93

★★★ **CA-Cricket Draw III 2.0 (2.01), Computer Associates International, 516/342-5224, $249.** This draw program is not going to inspire experienced Mac artists to jump up and down, but its features are abundant, the interface is straightforward, and the price is right. Oct 93

★★★ **Canvas 3.5, Deneba Software, 305/596-5644, $399.** Draw program offers two to three times as many features as any competing program, but our reviewer would prefer an interface that you can navigate without scrambling for the manual. Jan 94

★★ **ColorUp 1.0, Pantone, 201/935-5500, $99.95.** Professional graphic designers don't need the advice of this color tutorial and series of palettes. Although nonprofessionals might benefit from the information on color theory, it may not be worth the money. Nov 93

★★★★ **DeBabelizer 1.5 (1.5.5), Equilibrium Technologies, 415/332-4343, $299.** Bitmapped-graphics-conversion software supports a huge number of file formats and can work wonders. If you spend any significant time dealing with file conversion, you should have this program. Nov 93

★★★ **DesignWorkshop 1.0 (1.1), Artifice, 503/345-7421, $895.** The accessible interface and versatile modeling environment of this 3-D modeling software may be worth the fairly high price, particularly for architectural-design conceptualization. May 94

★ **Easy Color Paint 3.0, MECC, 612/569-1500, $59.95.** For a program that purports simplicity, this color paint program is anything but. Possibly the weakest, least intuitive paint program for the Mac, it's unnecessarily complex and frustrating. Jul 93

★★★ **Expert Draw 1.0, Expert Software, 305/**

continues

Star Ratings

567-9990, $49.95. Inexpensive draw program is not really for experts, but it offers a decent, no-frills set of basic drawing tools and commands for beginning illustrators, office use, or anyone on a budget. Aug 93

★★★★ **Folio 1 Media Kit-Print Pro, D'Pix, 614/299-7192, $499.95.** Each image in this texture collection on three CD-ROMs provides a dynamic range of colors, highlights, and shadows; is free of artifacts; and is crisply focused. Aug 93

★★★★ **Fractal Design Painter 2.0, Fractal Design Corp., 408/688-8800, $399.** If you can put up with a few inconveniences, this color paint software provides the tools required by professional artists, and many of its functions—natural-media brush tools, the color-sensitive magic wand—are entirely without peer. Jul 93

★★★ **Generic CADD 2.0, Autodesk, 206/487-2233, $495.** Competent, midlevel 2-D drafting program has a well-executed Mac interface, a good complement of tools, and a sprinkling of high-end features, such as floating-point precision. Aug 93

★★★ **Infini-D 2.5.1, 5pecular International, 413/253-3100, $695.** Serviceable 3-D graphics program has a wide range of modeling, rendering, and animation options, with a straightforward interface and quick operating speed. Feb 94

★★★★★ **Kai's Power Tools 2.0a, HSC 5oftware, 310/392-8441, $199.** Phenomenally powerful suite of Photoshop plug-ins have an addictive quality typically associated with arcade games. There's no end to the automated effects you can generate, the ways you can apply them, and the artwork you can create. May 94

★★★★ **MacroModel, Macromedia, 415/252-2000, $1495.** This 3-D–modeling software is a solid resource to have along when you venture out into 3-D space. The interface is elegantly simple, making the Mac's inner space a more pleasant place to work. May 94

★★★ **Ofoto 2.0 (2.02), Light 5ource Computer Images, 415/461-8000, $395.** Many new features—notably color support—have been added to the already impressive toolbox of this scanning software. It often produces good results, but it rarely produces the best scan possible for a given image and output method. Jul 93

★★★★ **Paint Alchemy 1.0, Xaos Tools, 415/487-7000, $99.** For the price, these plug-in graphics effects are a tremendous value that both casual users and professional artists can use to design a little chaos into their work. May 94

★★★★ **PosterWorks 3.0, 5. H. Pierce & Co., 617/338-2222, $395.** This large-format graphics production tool is for people who think big, up to 10,000 square feet big. It fills the need for user-defined, full-color, large-format output robustly and elegantly. Aug 93

★★★★ **PowerDraw 4.0 (5.0), Engineered 5oftware, 910/299-4843, $795.** The best new feature of this polished 2-D drafting program is an open architecture that supports modules that let you customize the program with application-specific tools, floating palettes, and menu commands. Sep 93

★★★★ **5howplace 2.0, Pixar, 510/236-4000, $495 to 695.** Adequate, entry-level, 3-D modeler is suitable for illustration and other graphic arts applications. This version offers improved access to MacRenderMan, one of the best renderers around, plus plug-in modeling tools. Apr 94

★★★ **5trataVision 3d 2.6.3, 5trata, 801/628-5218, $995.** 3-D program includes animation, and is a superior rendering tool and versatile modeler. It's a challenge to learn, however, as the interface is overly dense and sometimes sluggish. Feb 94

★★★★ **5tudioPro 1.0, Strata, 801/628-5218, $1495.** If you need a well-balanced, all-in-one 3-D modeling, rendering, and animation solution, this application is an excellent choice. Mar 94

★★★ **Transverter Pro 1.0 (1.51), TechPool, 216/291-1922, $395.** Remarkable graphics-conversion software can read PostScript files and convert them to a variety of formats. As you might expect of a program attempting to fill such a tall order, its conversions are not always flawless, but it can be a lifesaver nonetheless. Nov 93

★★★ **upFront 2.0, Alias Research, 416/362-9181, $299.** Capable modeler is something of an acquired taste. However, take the time to learn it and you'll find useful, if unconventional and demanding, tools that are well suited for architectural modeling. Jan 94

★★★ **Virtus WalkThrough 1.1, Virtus Corp., 919/467-9700, $195.** Interactive 3-D modeling tool provides instantaneous access to rendered 3-D scenes, allowing you to travel through models at will. While it has some problems (such as occasionally just quitting), it's an excellent value. Jul 93

★★★ **Wraptures One, Wraptures Two, Form and Function, 619/536-9999, $95 each.** The images in these texture collections on CD-ROM are generally acceptable, although some are muddy and others are difficult to decipher at low resolutions. If you need images for repeating patterns, however, these repeat seamlessly and are a good value. Aug 93

MATH/SCIENCE

★★★ **Alchemy III, Tripos Associates, 314/647-1099, $950.** Molecular-modeling software can model decapeptides and DNA fragments, in addition to the expected small molecules, with refreshing alacrity on a Mac IIci or better. Sep 93

★★★ **Amazing Universe 2.1 (2.1a), Hopkins Technology, 612/931-9376, $79.95.** Space-image exploration package on CD-ROM offers an amazing variety of astronomical images with a very competent program (ProVision II) for modifying and inspecting those images. It assumes that users won't be fazed by such things as writing their own image-convolution matrices. Aug 93

★★★★ **Caduceus Science Review Macintosh Project 1.0, Scientia, 617/776-3427, $150 to $250.** If you're taking the MCAT, you'd be nuts not to buy this interactive science review. With proper use, its 9MB of files are certain to improve your score. Apr 94

★★★★ **CircuitMaker 3.0, MicroCode Engineering, 801/226-4470, $199.95.** Much of the tedium of diagramming circuits and constructing prototypes is relieved by this digital circuit simulator that provides a powerful set of basic tools for a very reasonable price. Aug 93

★★★★ **C5C ChemOffice 2.0, Cambridge 5cientific Computing, 617/491-6862, $995 to $1595.** Comprehensive chemistry software is the Mac equivalent of software that seven years ago would have cost $200,000 and required an equally costly minicomputer. It's a winner. Feb 94

★★★★ **Data Desk 4.0 (4.1), Data Description, 607/257-1000, $595.** For finding patterns in data, this statistical-analysis program has no peer. Years of refinement have made it a uniquely valuable tool, despite its lack of some tests found in larger programs. May 93

★★★ **FA5TAT 2.0, 5Y5TAT, 708/864-5670, $199.** Statistical business-analysis software makes sense as a day-to-day statistics tool. It provides the right tests for most requirements, and its graph types provide plenty of information, although they lack glamour. Jun 93

★★★ **f(z) 6, Lascaux Graphics, 602/299-0661, $115.** The main problem this math software attacks is four-dimensional visualization. It costs slightly more than a textbook, making it a great educational bargain. Sep 93

★★★ **InStat 2.01, GraphPad 5oftware, 619/457-3909, $95.** For scientists with limited statistics backgrounds, the chatty clarity of this lab-oriented statistics software's help screens will be invaluable, while the limited variables and minimal graphics will not be a problem. Nov 93

★★★★ **MacPhase 1.2, Otter Solutions, 315/768-3956, $159.** Low-cost, scientific-data-visualization software with a large assortment of mathematical tools is an authentic bargain. A principal strength is a well-planned color-lookup-table editor that's delightfully easy to use. May 93

★★★ **MathCAD 3.1, Math5oft, 617/577-1017, $495.** Numerical and symbolic computation software is easy to learn and use, and is much more powerful than earlier versions. It does not compete in scope with the largest mathematics programs, but for most science and engineering tasks, it's a fast way to get problems solved. Jun 93

★★★★ **Mathematica 2.2, Wolfram Research, 217/398-0700, $595.** The one essential program in science and mathematics adds a function browser that makes the program as easy to use as it should be, as well as improvements to computational routines. Sep 93

★★★ **QC Tools 1.0, Abacus Concepts, 510/540-1949, $245.** Quality-control tool kit for StatView appears to introduce a slight slowdown in program response, but is generally well designed, well documented, and suitable for quality-control neophytes as well as professionals Jan 94

★★★★ **Spyglass Dicer 2.0, 5pyglass, 217/355-6000, $695.** Scientific 3-D visualization tool displays a two-dimensional slice through a three-dimensional object (which is represented in the computer by a data table). While Dicer pushes the limits of the Mac hardware, for its function this product is really the only game in town. Jul 93

★★★ **Spyglass Transform 3.0 (3.01), 5pyglass, 217/355-6000, $595.** Scientific-visualization software can access data stored in every common format, offers some useful presentation-graphics features, and includes a programming language with a large range of built-in, high-level scientific functions. Sep 93

★★★★ **5tatView 4.01 (4.02), Abacus Concepts, 510/540-1949, $595.** If your work uses statistics for decision support rather than abstract analysis, and you regularly have to present your results to nonstatisticians, this is the statistics package for you. Oct 93

★★★ **5um Total 1.01, Concurrent Engineering Tools, 602/464-8208, $99.95.** Exceptional calculator utility is packed with advanced features, including a mode that lets you sample colors and use the numerical color values in calculations. The convenient palette approach causes a distinct time-lag in menu operations. Oct 93

★★★★ **Theorist 1.5, Prescience Corp., 415/543-2252, $289.95.** Symbolic-math program that you can figure out by yourself adds a useful table feature, more special functions of physics, and better graphics. It's still the only program to use real notation directly. May 93

★★★★ **Turing's World 3.0, C5LI Publications, 312/568-1550, $19.95.** Computer-science educational software lets you investigate some fundamentals in computing at an almost unbelievable bargain price. Feb 94

★★★★ **Visualization of Natural Phenomena, Telos/5pringer Verlag, 408/249-9314, $59.95.** CD-ROM introduction to applying all aspects of computer

graphics to scientific imaging covers all disciplines and offers definitive analysis of methods. No other source covers this much material, at this level of clarity. Jan 94

★★★★★ **Voyager II 1.0 (1.01), Carina Software, 510/352-7328, $159.95.** If a brilliantly lit, star-filled sky holds more than a moment's fascination for you, you need to know about this astronomy program. In a firmament of mostly faint and forgettable astronomy software, it's a supernova. Jul 93

ORGANIZATION/PRODUCTIVITY

★★★ **Achieving Your Career 1.02 (1.04), Up Software, 415/921-4691, $69.** HyperCard-based job-search software succeeds by compactly organizing. It provides a structure for identifying letters to write, phone calls to make, and interviews to follow up. Aug 93

★★★★ **Arrange 1.1, Common Knowledge, 415/325-9900, $349.** This personal information database's flexible, intuitive approach to data-handling makes it an excellent tool for storing all kinds of day-to-day information. May 94

★★★★ **CalendarMaker 4.0, CE Software, 515/224-1995, $59.95.** Polished, intuitive calendar-making program is straightforward, with a variety of options for customizing your calendar. Some features can be cumbersome. Oct 93

★★ **ClienTrac 1.7.1 (1.7.2), Whiskey Hill Software, 415/851-8702, $135.** Easy-to-use, HyperCard-based contact-management software performs as billed, but fails to inspire much enthusiasm. Aug 93

★★★ **Contact Ease 2.0.1 (2.0.2), WestWare, 619/274-5053, $395 to $1495.** Contact-management and sales-automation software helps salespeople keep in touch with contacts, makes it easy to generate letters, and maintains detailed records of activities. It has a few quirks but is overall a good program. Aug 93

★★★★ **DateBook and TouchBase Pro Bundle, Aldus Corp. Consumer Division, 619/558-6000, $149.95.** Calendar and contact manager offer a superior combination of integration, usefulness, and features. If you want to get organized, make sure you look at this dynamic duo. Feb 94

★★★★ **In Control 2.0, Attain Corp., 617/776-1110, $89.95.** The best features of an outlining program are combined with those of a database, making it easy to sort, search, organize, and print your to-do list. Aug 93

★★★ **Now Contact 1.0, Now Software, 503/274-2800, $99.** This contact manager has some innovative features and could easily become the top address-book program for the Mac by adding some features, such as file reconciliation. Mar 94

★★★★ **Now Up-to-Date 2.0, Now Software, 503/274-2800, $69.95 to $599.** Calendar utility combines flexibility, ease-of-use, and streamlined operations in an almost irresistible package. The Reminder control panel, although it is a great new feature, has had minor conflicts. Jun 93

★★★ **Power Team 1.0, ProVue Development Corp., 714/892-8199, $149.95.** Personal information manager consists of seven modules: Phone Book, Calendar, Correspondence, Checkbook, Calculator, Expense Report, and Mailing List. It has some bugs, but the data entry features are excellent. Oct 93

★★ **Rae Assist 1.0.2, Rae Technology, 408/725-2850, $199.** Although this personal-information manager offers some fresh ideas, including automatic linking of company and contact information, it's too big and too slow. Jan 94

PRESENTATION TOOLS

★★★★ **Adobe Premiere 3.0, Adobe Systems, 415/961-4400, $695.** Solid and dependable QuickTime video-editing software offers a structured, responsive, and flexible interface with enhancements that range from the mundane to the dramatic. It can now mix 99 tracks. Jan 94

★★★★ **Astound 1.0, Gold Disk, 408/982-0200, $399.** Presentation software lets you include sound, text, and graphics animation with no more effort than pasting in a chart in other products. It's a good value. Nov 93

★★★★ **Authorware Professional 2.0.1, Macromedia, 415/252-2000, $4995.** Multimedia-scripting and -presentation software lets you develop complex presentations with amazing speed. Although expensive, it's wonderfully done and will pay for itself in time saved. Feb 94

★★★ **Avid VideoShop 2.0, Avid Technology, 508/640-6789, $499.** QuickTime video-editing program shines in its intuitive, easy-to-use interface, although it may fall short on features for hard-core video professionals. Feb 94

★★★★ **CoSA After Effects 1.1, CoSA, 401/831-2672, $1295.** QuickTime movie editor blurs the boundaries between animation and traditional video-editing. It produces results that simply can't be created in other packages. Oct 93

★★ **Elastic Reality 1.0, A5DG, 608/273-6585, $349.** Exciting morphing tool can create professional-caliber results—if you can figure out how to use it. The needlessly convoluted interface, poor documentation, and inadequate tech support make that a difficult task. Feb 94

★★★ **Hi Rez Audio Volume 1.0, Presto Studios, 619/689-4895, $149.95.** The enjoyable, high-quality music on this CD-ROM adds a nice touch to presentations. The software for browsing the music is quirky, and the product could use some documentation. Jul 93

★★★ **Interactive Training for Director 1.1, Media In Motion, 415/621-0707, $199.** This somewhat expensive program teaches basic Macromedia Director skills and provides a foundation for exploring Director's other features. It has a clear, often lighthearted approach, but navigating the lessons can be frustrating. Jun 93

★★★★ **Morph 2.0, Gryphon Software, 619/454-6836, $239.** Easy to use morphing software is beautifully designed, with delightful new features, including the ability to morph QuickTime movies. Using it is as painless as morphing gets. Apr 94

★★ **MovieWorks 1.1 (2.0), Interactive Solutions, 415/377-0136, $395.** Over 100 bugs were fixed in version 1.1 of this multimedia authoring software that takes an all-in-one approach to creating presentations, but problems remain. It's a good idea, poorly executed. Jun 93

★★★ **Passport Producer Pro 1.0, Passport Designs, 415/726-0280, $995.** Superb, albeit quite expensive, media-integration package makes assembling even complex presentations surprisingly easy. Path animation is limited to entrances and exits. Apr 94

★★★ **QuickFlix 1.0, VideoFusion, 419/891-1090, $149.** Approachable QuickTime moviemaking software lacks the high-end features of other programs but costs a whole lot less. Feb 94

★★★ **VideoFusion 1.0.1 (1.5), VideoFusion, 419/891-1090, $649.** Collection of special effects for QuickTime movies may not be for the casual user, but if you have the equipment and you can't live without spinning logos, then go ahead and indulge. Jul 93

★★★★ **Working Model 1.0, Knowledge Revolution, 415/553-8153, $995.** Animators and engineers will love this terrific motion simulator that mimics real motion by applying physical laws to objects. It's easy to learn and use, but you'll need some understanding of math and physics. Oct 93

PROGRAMMING

★★★ **CLImate 1.0, Orchard Software, 617/876-4608, $59.95.** With a little more documentation and a few more sample programs, this utility that provides a subset of Unix-like commands for the Mac environment could be an irresistable package. Oct 93

★★★★ **FutureBASIC 1.0 (1.02), Zedcor, 602/881-8101, $299.95.** Complete, easy-to-learn, real-world programming tool has full Toolbox, System 7, and assembler support. It's a wonderful tool that's rapidly becoming a favorite among commercial developers. Jul 93

★★★ **Macintosh Common Lisp 2.0 (2.0.1), APDA, 716/871-6555, $495.** Anyone who likes programming in LISP will be pleased with the environment provided by this version of the standard dialect and its extensive debugging and interface-building facilities. Oct 93

★★★ **Object Logo Student Edition, Paradigm Software, 617/576-7675, $49.95.** This book-plus-disk package offers a wide-ranging introduction to programming concepts. It's aimed roughly at the high-school educational level and lets you see something happen for every few lines of code you type. Jul 93

★★★★ **Object Master for Think C and C++, ACI US, 408/252-4444, $255.** Object-oriented development environment is full of goodies and will pay for itself in about a week due to increased programmer productivity. Apr 94

★★★★ **PG:Pro 1.5 (2.1), Staz Software, 601/255-7085, $169.** For part-time or novice programmers, the combination of these BASIC programming tools and FutureBASIC is a fast path to a working program. Jul 93

★★★ **PowerPacks 2.0, NDG Phoenix, 301/718-8880, $225.** Programmers' tool kit for 4th Dimension provides 280 external procedures to improve custom applications and exploit System 7 features. Don't expect any quick fixes for 4D's less-than-blistering performance in most areas, though. Oct 93

★★★★ **Smalltalk/V for Macintosh 2.0, Digitalk, 714/513-3000, $495.** Object-oriented development system is now even more viable for commercial projects. The customer support and documentation set a standard other vendors should emulate. Feb 94

★★★ **SoftPolish 1.1, Language Systems Corp., 703/478-0181, $295.** Program-quality-assurance utility systematically checks the resources in a program's interface against a huge laundry list of errors. It's a programming tool for anyone who hopes to produce a commercial Mac application. Sep 93

★★★ **SourceSafe 2.1, One Tree Software, 919/821-2300, $295 to $1195.** Solid, relatively easy-to-use product handles program-development administrative tasks, including version control, for multiplatform programs being created by groups. Sep 93

★★★★ **Symantec C++ for Macintosh 6.0, Symantec Corp., 408/253-9600, $499.** If you like Think C, you'll like this software-development system, too. For the Mac, it's an excellent opportunity to catch a new wave in programming. Nov 93

★★★★ **VIP-C 1.0.1, Mainstay, 805/484-9400, $495.** If you've mastered the rudiments of C, this

continues

Star Ratings

programming-code generator will let you code about ten times faster than you could using only an editor. Its real strength is in rapidly assembling smaller projects. **May 94**

UTILITIES

★★★ **7th Heaven 2.5 (2.5.1), Logical Solutions, 612/659-2495, $99.95.** Our reviewer found the seven enhancements to System 7 fun and elegantly done, but not all of them were useful. **Jul 93**

★★★ **Alki Seek 2.1, Alki Software Corp., 206/286-2600, $39.95.** Competent file-finding utility scans by file name or content and lets you combine multiple search criteria. It cannot search in the background or find text in compressed files. **Jul 93**

★★★ **AppleSearch 1.0, Apple Computer, 408/996-1010, $1799.** Although it has some rough edges, this product for archiving and retrieving text is highly useful. It presents retrieved information clearly and extracts text from documents in many formats. **May 94**

★★★ **Atticus Vista 1.0, Atticus Software Corp., 203/348-6100, $69.95.** Control panel and application automatically catalog the disks you mount on the desktop. It has a few problems, including limited search options, but it can help bring order to disorganized disk collections. **May 94**

★★★ **Billy Steinberg's PBTools 1.0.1, Inline Software, 203/435-4995, $99.55.** If you want basic PowerBook management without added frills or complex menu bar displays, this collection of four utilities may be just your cup of tea. **Jul 93**

★★★★ **CD-ROM ToolKit 1.0.5, FWB, 415/474-8055, $79.** Software accelerator can halve the time it takes to open files and search on a CD-ROM. The product supports a wide variety of formats and CD-ROM drives, but users should be aware that playback of QuickTime movies is often uneven. **May 94**

★★★ **Chameleon 2.0.3 (2.1), Logical Solutions, 612/659-2495, $59.95.** Sleek desktop-pattern editor comes with an ample supply of rich, textured color images and a set of limited but functional editing tools. **Sep 93**

★★★★ **ClickChange 2.0, Dubl-Click Software, 818/888-2068, $89.95.** Interface-customizing package has nothing you need but is filled with everything you want, including tools that let you alter major elements of the Mac's look and feel. **Aug 93**

★★★ **Connectix Desktop Utilities 1.0 (1.0.1), Connectix Corp., 415/571-5100, $99.** Although some of the 16 utilities offered in this package are more at home on a PowerBook, this collection offers one-stop shopping at a low price. It's worth it for the file-synchronization, Keyboard Power, and Hot Keys features alone. **Nov 93**

★★★★ **CopyDoubler 2.0 (2.0.1), Symantec/Fifth Generation Systems, 504/291-7221, $59.** This utility speeds up copying, lets you queue jobs for background copying, and offers other useful copying-oriented features—all at a very reasonable price. **Nov 93**

★★★ **Copyright Pro 1.0.3, CSG Technologies, 412/471-7170, $79.** Utility takes over the Finder's copying function, copies in the background, and allows you to regularly schedule copying. It doesn't speed up copying, however. **Nov 93**

★★★★ **CPU 2.0 (2.0.1), Connectix Corp., 415/571-5100, $99.** Reasonably priced collection of utilities for the PowerBook adds new features, including file synchronization, that easily justify the upgrade price. **Sep 93**

★★★ **CryptoMactic 1.0.1, Kent Marsh, 713/522-5625, $99.** Security software offers fast Finder-level encryption and decryption with effective file removal. Although its simplest encryption algorithm isn't quite hacker-proof, it's worth considering. **Feb 94**

★★★★ **DiskLock PB 1.0, Symantec/Fifth Generation Systems, 504/291-7221, $59.** PowerBook security software balances robust security with simplicity and ease of use. It's much harder to crack than most PowerBook utility collections' security features, and will keep out all but the most determined. **Jan 94**

★★★ **The Disney Collection Screen Saver, Berkeley Systems, 510/540-5535, $49.95.** Mickey, Goofy, Peter Pan, Ariel, and other Disney favorites cavort around your screen with this screen saver that includes 16 different modules. **Mar 94**

★★★ **DriveShare 1.03, Casa Blanca Works, 415/461-2227, $129.95.** This utility allows users to share a removable drive over a network. It's most useful if your network consists of both System 6 and System 7 users, as its advantages over System 7 file sharing are slight. **Nov 93**

★ **DriveTech 1.0, MicroMat Computer Systems, 415/898-6227, $59.95.** Without decent documentation or clearer error messages, this floppy-drive cleaning and diagnostic program is essentially a $60 floppy-drive cleaning kit. Since you can buy a cleaning kit without software for $10, that makes it a bad deal. **Jan 94**

★★★ **DupLocator 1.03, Midnight Software, 303/933-1013, $99.** For new Macintosh users who don't have a general file utility, this software that locates duplicate files, as well as performs basic file commands such as moving and renaming files, may be useful. **Jan 94**

★★ **DynoPage 2.0, Portfolio Software, 802/865-2700, $59.95.** While this utility simplifies the printing of booklets and double-sided pages, it doesn't support PostScript graphics, is incompatible with some popular applications, and has a buggy drag-and-drop feature. **Jul 93**

★ **eDisk 1.0 (1.2), Alysis Software Corp., 415/566-2263, $149.95.** Driver-level compression software has little to recommend it over file-level, idle-time compression programs. The biggest drawback is the strong potential for disk or file corruption. **Oct 93**

★★★ **Freedom of Press Classic, ColorAge, 508/667-8585, $149.** Utility allows you to print PostScript graphics on almost any non-PostScript printer—easily and with impressive results. **Mar 94**

★★★ **Icon 7, Inline Software, 203/435-4995, $79.95.** Simple, straightforward utility has a streamlined and intuitive library feature for storing and retrieving icons, plus tools for icon editing. Its icon collection, however, is pretty paltry. **Sep 93**

★★★ **Icon-It Pro 3.0.6, Olduvai Corp., 305/670-1112, $129.** Utility allows you to attach custom tool bars to almost any application, including the Finder. The interface is quirky, but you get used to it. **Dec 93**

★★★ **I Like Icon 1.0, Baseline Publishing, 901/682-9676, $59.95.** Glitzy utility has tools for icon editing, has a nice library of icons, and can create animated icons. Some basic features, such as a text tool, are missing, and the animated icons are fun but impractical. **Sep 93**

★★★★ **KidDesk 1.0 (1.1), Edmark Corp., 206/556-8484, $39.95.** If you have young children who love to experiment with your Mac, this desktop environment provides easily navigable play while protecting your files from the havoc that little fingers can wreak. **Jun 93**

★★★ **MacPak 1.0, Symantec/Fifth Generation Systems, 504/291-7221, $149.** The quality of this utility collection is uneven—some modules are unpolished—but if you don't already own AutoDoubler, CopyDoubler, and a good file-management program, it's worth the price. **Jan 94**

★★★★ **MacTools 3.0, Central Point Software, 503/690-8090, $149.** Recovering trashed files is a snap with this utility package that fixes more disk problems than its competition. It includes disk-and-file maintenance, disk repair, virus protection, and backup. **Mar 94**

★★ **Magic Typist 2.0, Olduvai Corp., 305/670-1112, $129.** If you want to speed up typing of repetitive phrases or if you don't have full use of your hands, this utility, which automates typing of repetitive phrases, may be useful, but some functions work erratically or not at all in Microsoft Word. **Sep 93**

★★★★ **Mr. File 2.0, Softways, 408/978-9167, $99.** The well-designed background capabilities of this Finder utility make it a handy tool for copying, finding, moving, launching, and renaming files, although it has a few interface quirks. **Dec 93**

★★★ **Now Compress 1.0 (1.0.1), Now Software, 503/274-2800, $99.** Compression utility holds its own in a crowded market; it's easy to use, it's complete, and it compresses as well as or better than other options. **Dec 93**

★★★ **Now Fun, Now Software, 503/274-2800, $69.** Five control panels let you liven up your Mac by customizing everything from menu colors to system sounds. The included screen-saver modules and desktop patterns and pictures are fairly limited, though. **Dec 93**

★★★★ **Now Utilities 4.0.1 (4.0.1p), Now Software, 503/274-2800, $129.** Many thoughtful improvements have been added to this collection of utilities, which is now better integrated, more logically designed, and still an excellent deal for your dollar. The new scrapbook feature, however, is awkward and inconvenient. **Aug 93**

★★★ **Open Sesame 1.02, Charles River Analytics, 617/491-3474, $99.** Utility automates Finder operations, such as opening and closing files, without resorting to macros or scripts. It has an elegant interface, but people with strict work habits are more likely to find its suggestions worthwhile than are those who don't follow a routine. **May 94**

★★★ **OptiMem 1.4.1, Jump Development Group, 412/681-2692, $129.** Systemwide memory manager monitors RAM use and allocates RAM where it's needed. Works best with software that handles minimum-memory situations effectively. **Mar 94**

★★★ **Peace of Mind 1.2.2 (1.3.3), Diag5oft, 408/438-8247, $149.** Hardware diagnostic tool performs exhaustive tests on major Mac hardware components; does an excellent job of diagnosing simple simulated hardware errors. The program has minor bugs and lacks a comparative test-history feature. **Jun 93**

★★★ **Power To Go 2.0, Claris Corp., 408/727-8227, $99.** PowerBook utility collection has a few unique slants—including a floating palette that can display battery-life estimates—that keep it above the also-rans. It does lack features of similar products. **Dec 93**

★★★ **Public Utilities for the Macintosh 1.0, Symantec/Fifth Generation Systems, 504/291-7221, $149.** Utility sticks to the basics of disk diagnosis, disk repair, and file optimization. It does a good, and sometimes unique, job, but disk optimization is slow. **Jun 93**

★★★★ **QuicKeys 3.0, CE Software, 515/221-1801, $169.** The simple, unintimidating interface of this macro-building utility allows you to build a set of useful shortcuts quickly. **Mar 94**

★★★★ **RAM Doubler 1.0.1, Connectix Corp., 415/571-5100, $99.** Inexpensive system extension doubles available RAM for many Macintosh users. There are a number of requirements, however, including System 7, 4MB of physical RAM, and a 68030 board. **May 94**

continues



One of these is a color proof and one is output from our new printer. We forgot which is which.

We paid $70 and waited three days for one of these. The other popped out of our new Tektronix Phaser™ 480 in minutes. Pull out your loupe and start guessing. And while you're down there staring, note our output's phenomenal color. PANTONE®-approved, it's perfect for matching those tricky product colors, logos and skin tones. You might also notice the full 11" x 17" print area. Yes, Virginia, there are tabloid-sized full bleeds. And it shares easily: the Phaser 480 is a work group printer for Macs, PCs or workstations. Plus, it boasts a powerful RISC processor and true Adobe® PostScript™ Level 2. Spread-sized bleeds? Reprint quality comps? Pre-film proofing right at your desk? Welcome to preproduction heaven.

So head down to your nearest Tektronix dealer to see for yourself. And by the way, our guess is that the one on the bottom is our print. Well, then again ...



Tektronix

For a free print sample or dealer location call 800/835-6100, Dept. 32C.

Phaser is trademark of Tektronix, Inc. All other marks are trademarks or registered trademarks of their respective companies.

Circle 143 on reader service card

Star Ratings

★★★ **Redux Deluxe 2.0.2, Inline 5oftware, 203/435-4995, $79.95.** Easy to learn and relatively simple to use, this backup program has some powerful features, such as scripting, but it doesn't have a compression option. Jan 94

★★★★ **Retrospect 2.0, Dantz Development Corp., 510/253-3000, $249.** Powerful backup and archiving software has an improved interface and scripting capabilities, and works well for all levels of users. Sep 93

★★★★ **Retrospect Remote 2.0, Dantz Development Corp., 510/253-3000, $449.** Utility allows fast, automatic backup of networked Macs to a central Mac with a backup device. It worked flawlessly in our reviewer's tests. Sep 93

★★★ **5afe and 5ound, Central Point 5oftware, 503/690-8090, $49.95.** Limited but useful disk-protection and -salvage utility has a clean, simple interface and is an efficient emergency recovery tool. Jun 93

★★ **5afeDeposit 1.2, Dayna Communications, 801/269-7200, $189.** Automated backup program is easy to set up but slow. Also, unattended backups must be restarted from scratch if disk space runs short and a new disk isn't inserted. Sep 93

★★ **5afe or 5orry 1.0, Olduvai Corp., 305/670-1112, $59.** Unobtrusive control panel periodically saves all of your keystrokes, but requires System 7.1 and offers no clear-cut advantages when compared with other text-recovery programs. Oct 93

★★★★ **5AM 3.5.8, Symantec Corp., 408/253-9600, $99.** Efficient, thorough virus-protection software slows down system start-up and application launching, but this program is a worthwhile investment for anyone who exchanges or downloads files. Mar 94

★★★★ **Screenscapes 1.0.1, Kiwi Software, 805/685-4031, $44.95.** With more than 600 desktop patterns—and a suite of well-designed modules to transform those patterns—this fun and frivolous utility lifts desktop-pattern design to new heights of elegance. Nov 93

★★★ **5quare One 1.5.2, Binary Software, 310/582-8293, $74.** Flexible, attractive icon-based file launcher provides infinitely customizable palettes, including one that displays active applications. The application will consume 400K of your system memory. Aug 93

★★ **5tacker for the Macintosh 1.0.1, Stac, the Data Compression Company, 619/431-7474, $149.** As long as you pay attention to the capacity of your hard drive, this driver-level compression product performs reasonably well, except for its slow hard drive read quotient. Oct 93

★★★★ **5tar Wars Visual Clips, Sound 5ource Unlimited, 805/494-9996, $89.95.** Control panel lets you play QuickTime movie clips from *Star Wars* at system events. If you have the money, the hard drive space, and the RAM, this is the kind of totally cool toy that will make you remember why you love your Mac. Sep 93

★★★ **Tempo II Plus 3.0.9, Affinity Microsystems, 303/442-4840, $179.95.** Very capable macro-creating utility may be daunting for novices but offers plenty of power for advanced users. Mar 94

★★★★ **TimesTwo 2.0, Golden Triangle Computers, 619/587-0110, $149.** This driver-level compression utility is transparent and robust. It caused no problems through a two-month course of testing, on a system with myriad utilities and system software tools. Mar 94

★★★★ **Toner Tuner 1.0.3, Working 5oftware, 408/423-5696, $24.95.** Inexpensive, incredibly useful extension adds a sliding bar to print dialog boxes allowing you to adjust the amount of toner applied to each print job. If you can't save trees, you can at least save toner. Dec 93

★★★★ **ultra5hield 1.252 (1.3), usrEZ 5oftware, 714/756-5140, $149.** Sophisticated security product combines practically every feature you might need into an integrated package, including a lightning-fast version of the U.S. government data-encryption standard. Dec 93

★★★★ **Virex 5.0, Datawatch Corp., 919/549-0711, $99.95.** The extremely fast, trouble-free performance of this software makes the task of guarding against computer viruses almost painless. Its speed puts it ahead of the pack. May 94

★★★ **Virtual 3.0.1, Connectix Corp., 415/571-5100, $99.** If you need to eke out as much virtual memory speed as possible, this utility may be a useful tool. For System 6 users who want virtual memory, it's the only game in town. Sep 93

★★★ **Working Watermarker 1.02, Working Software, 408/423-5696, $49.95.** Simple, useful system extension allows you to print or fax text and/or graphics "watermarks" in the background of virtually any document. Although it has imperfections, it's earned a permanent spot in our reviewer's System Folder. Jan 94

VERTICAL MARKET

★★★★ **Claire, The Personal Music Coach 1.0.1, Opcode 5ystems, 415/856-3333, $129.95.** Musicianship program teaches pitch and interval recognition, sight singing, and intonation. Although the interface is nonstandard, it's logical and easy to learn. May 94

★★★★ **Finale 3.0.1, Coda Music Technology, 800/843-2066, $749.** Upgraded music-notation software is now infinitely more pleasant to use. Its comprehensive feature set makes it the standard against which all other music-notation products must be judged. Dec 93

★★ **MacInteriors, Microspot, 408/253-2000, $129.** Correctly placing objects is unduly cumbersome in this interior-design software, but once you catch on to the program's quirks, it's useful. Feb 94

★★★★ **Musicshop 1.0, Opcode 5ystems, 415/856-3333, $149.95.** MIDI sequencer is an excellent choice as a first sequencer. It's powerful enough to satisfy the needs of most MIDI users. Oct 93

★★★ **Roll Call 2.0 (2.5.6 or 3.0), By the Numbers, 603/927-4508, $495 to $595.** 4th Dimension database application for church management helps track donations, attendance, church-group membership, and visitation. While not a complete church-management system, it's an acceptable complement to a general accounting program. Aug 93

★★★ **5ailing Master 1.1, 5tarboard Software, 313/662-4393, $64.99.** Though the slow speed and jerky motion point to less-than-polished programming, this sailboat-racing simulation offers good tactical play and is fun—well worth the price for sailing competitors. Nov 93

WRITING TOOLS

★★★★ **MacWrite Pro 1.5, Claris Corp., 408/727-8227, $249.** The clean, uncluttered interface of this low- to middle-level word processor is still one of its major assets. This upgrade adds support for QuickTime, PowerTalk, AppleScript, and more. May 94

★★ **MasterWord 5.1, Alki 5oftware Corp., 206/286-2600, $99.95.** The centerpiece of this package of add-on Microsoft Word commands is a set of customizable tool bars. Unfortunately, rough edges remain, including inaccuracies in the documentation and some features that don't work as advertised. Aug 93

★ **The Oxford English Dictionary, Oxford University Press, Electronic Publishing, 212/679-7300 ext.7370, $895.** CD-ROM dictionary contains 20 print volumes, including half a million words, but the flaws, omissions, unreliability and unforgivably poor design are unbearable. Apr 94

★★★ **Random House Unabridged Dictionary, Random House Electronic Publishing, 212/572-2600, $179.** The most comprehensive American-made dictionary on CD-ROM works within any program and is good at guessing misspelled words. Although some functions don't work reliably, the quality and design of the software are better than those of other dictionaries on CD-ROM. May 94

★★★ **5pelling Coach Professional 4.0.1, Deneba 5oftware, 305/596-5644, $195.** If you're considering investing in reference software, this spelling checker, dictionary, and thesaurus is a relatively capable, if expensive, alternative. Oct 93

★★★★ **Thunder 7 1.5.3, Baseline Publishing, 901/682-9676, $99.95.** Stand-alone spelling checker and thesaurus interactively monitors your keystrokes and alerts you to potential errors as they are entered. It quickly and transparently prevents you from making embarrassing typos. Nov 93

★★★★ **WordPerfect for Macintosh 3.0, WordPerfect Corp., 801/225-5000, $495.** The innovative interface of this word processor uses context-sensitive button bars and expandable rulers to make innumerable features accessible with a click of the mouse. It's an accomplishment in ease of use. Mar 94

★★★ **A Zillion Kajillion Rhymes 1.0, Eccentric 5oftware, 206/628-2687, $49.95.** Rhyming dictionary is quick, small, simple, and self-contained; but it only rhymes with the roots of search words (and ignores *-ed, -s,* and *-ing* endings). Nov 93

Hardware

MISCELLANEOUS HARDWARE

★★ **AC5100, Altec Lansing Consumer Products, 717/296-2818, $180.** Lightweight powered speakers don't sound as good as they should. There's too much emphasis on the high end at the expense of the midrange, and they hiss noticeably. Dec 93

★★ **AC5150, Altec Lansing Consumer Products, 717/296-2818, $150.** Subwoofer rounds out the sharp tones of the ACS100, but the bass response is neither punchy enough nor loud enough, and the unit is about the size and weight of a concrete block. Dec 93

★★ **Address Express, CoStar Corp., 203/661-9700, $499.** Flaky performance and system crashes plagued this envelope-and-label printer in our tests, but the print quality was good. Oct 93

★★ **Apple Adjustable Keyboard, Apple Computer, 408/996-1010, $219.** Keyboard is only a slight improvement on the flat slab keyboard. Theoretically, it corrects ulnar deviation, but many sufferers of repetitive stress injuries want a keyboard that adjusts vertically. Jul 93

★★★★ **AppleCD 300, Apple Computer, 408/996-1010, $599.** Double-speed CD-ROM drive spins its discs at twice the speed of earlier drives, providing faster access to large files. Jun 93

★★★★ **Apple Color One5canner, Apple Computer, 408/996-1010, $1349.** Tests of this color scanner demonstrate unpolluted colors and sharp image

continues

STATISTICA/Mac

NEW rel. 4.0

TATISTICA/Mac™ A complete statistical data analysis system
n hundreds of presentation-quality graphs integrated with all procedures ■
lepth, comprehensive implementations of: *Exploratory techniques; Descriptive tistics; Frequency tables; Large selection of nonparametric tests; Stepwise ltiple regression methods with extended diagnostics; General nonlinear mation (with predefined or user-specified models); Logit/Probit analysis; neral implementation of ANOVA/ANCOVA/MANOVA/MANCOVA (designs of ctically unlimited complexity, repeated, nested, incomplete, random, chang- covariates, contrast analyses, post-hoc tests, custom designs); Discriminant ction analysis statistics; Canonical analysis statistics; Time series modeling hniques with forecasting; Factor analysis with rotations; Cluster analysis cl. hierarchical, k-means, and 2-way joining); General survival/failure time lysis (incl. life tables, group comparisons, and regression models); Distri- ion fitting (a large selection of continuous and discrete distributions); ve and surface fitting and smoothing (incl. spline, DWLS, NEXP, and others);* much more ■ Manual with comprehensive introductions to each method and -by-step examples (Quick Start booklet explains all major conventions); balloon ■ Extensive data management facilities: a super-fast spreadsheet of unlimited acity with formulas (and Publish and Subscribe); merge/split files; "double ntity" of values (numeric/text); BASIC-like data transformations programming guage; Import/Export data and graphs from/to Excel, MacSS, CSS and other nats ■ Graphs integrated with all procedures (e.g., click on a correlation fficient to produce the corresponding scatterplot and other graphs; click on a able in the descriptive statistics table to produce a histogram and other graphs; k on an interaction effect in the ANOVA table to see a plot of interaction) ■ Large ction of 2-dimensional graphs: *Histograms (incl. multiple, clustered break- ns, overlaid functions), Scatterplots (incl. multiple, weighted frequency, othed, function fitting), Multiple line and Range plots, Trend plots, Standard iation plots, Data sequence diagrams, Contour plots, Box-and-whisker plots, umn plots, Bar graphs, Double pie charts, Scrollable dendrograms, Two-way ing plots, Curve fitting plots, Distribution comparison plots, Range plots, bability plots, Amalgamation plots, Factor space plots, Casewise outlier and dual diagrams, ANOVA interaction plots, Multivariate (multiple) matrix 's, exploratory Draftsman plots with histograms,* and many other specialized s ■ Large selection of 3-dimensional graphs: *3D surface plots (with data othing procedures, color or gray-scale shading, and projected contours), 3D tterplots, 3D block scatterplots, 3D axis (space) plots, 3D spectral plots with stable planes, 3D line/ribbon plots, 3D sequence block plots, 3D histograms, surface-smoothed frequency plots, and 3D range plots ("flying boxes")* ■ All plots displayed in true perspective, feature interactive real-time rotation facilities l. continuous rotation) ■ Extensive graph customization options: all structural ects of graphs (axes, scaling, patterns, colors, sizes, styles, regions, perspective, tion, fitted functions, etc.); MacDraw-style tools with specialized "objects"; es graph and artwork embedding; page layout/preview; dynamic rulers; Publish Subscribe graph links ■ All output displayed in Scrollsheets™ (dynamic, rnally scrollable tables: all numbers can be instantly converted into a variety of screen customizable, presentation-quality graphs) ■ All Scrollsheets can be saved data files and used for input, or exported ■ Flexible facilities to perform analyses specific subsets of data ■ Extremely large analysis designs ■ Unlimited size of ■ Extended precision ■ Unmatched speed (e.g., on a Mac IIfx, arbitrary rotation surface with 1,000 points takes 1 second; correlation matrix 50x50 with 100 es—less than 3 seconds; transposing a 5,000 data points file—less than 2 nds) ■ Full support for System 7 ("savvy") incl. "Publish and Subscribe," Apple ts, balloon help, "drag and drop," 32-bit, Quadra cache, etc. ■ Price: **$695.**

uick STATISTICA/Mac™ A subset of STATISTICA/Mac ■ All ic statistical modules of STATISTICA/Mac (*Basic and Descriptive Statistics, quency tables, Exploratory data analysis, Nonparametrics, Distribution Fit- , Stepwise multiple regression; ANOVA/ANCOVA*) ■ Manual with comprehen- introductions to each method and step-by-step examples (Quick Start booklet lains all major conventions) ■ All data management facilities of STATISTICA/Mac ll graphics facilities of STATISTICA/Mac (including interactive rotation of all 3D phs, extensive on-screen graph customization facilities) ■ Price: **$395.**

OS versions also available (can exchange data with Macintosh ver- s): STATISTICA/DOS™ **$795**; Quick STATISTICA/DOS™ **$295**.

nestic sh/h $10 per product; please specify type of computer with order; 14-day ney-back guarantee.

StatSoft™

25 E. 13th St. • Tulsa, OK 74104 • (918) 583-4149
x: (918) 583-4376

erseas Offices: Statsoft of Europe (Hamburg, FRG), ph: 040/4200347, fax: 040/4911310; **StatSoft UK** (London, UK), ph: 0462/482822, fax: 0462/482855; **StatSoft Pacific** (Melbourne, Australia), ph:) 663 6580, fax: (03) 663 6117; **StatSoft Canada-CCO** (Ontario), ph: 905-849-0737, fax 905-849-0918; Available From: CORPORATE SOFTWARE and other Authorized Representatives Worldwide: land: MAB Julsing, 071-230410; France: Version US (1) 40590913; Sweden: AkademiData 018-240035; Hungary: P&D Soft KFT 185-6868; Belgium: TEXMA 10 61 16 28; South Africe: Osiris 12 663-4500; an: Three's Company, Inc. 03 -3770 -7600

, StatSoft, STATISTICA/Mac, STATISTICA/DOS, and Scrollsheet are trademarks of StatSoft, Inc.; Macintosh, Mac fx, Excel and MacDraw are trademarks of their respective companies.

rcle 99 on reader service card

Star Ratings

details, perhaps due to color filters and lenses that Apple claims were designed and tuned for the scanner. **Jul 93**

★★★ **AppleDesign Powered Speakers, Apple Computer, 408/996-1010, $179.** Tall and curvy powered speaker set looks and sounds good and can produce uncomfortably high volumes without noticeable distortion, but the bare-wire-and-terminal connections aren't user-friendly. **Dec 93**

★★★ **Apple Newton MessagePad, Apple Computer, 408/996-1010, $699.** Although Apple released this personal digital assistant too early and marketing hype led to mistaken expectations, this is a very intelligent piece of work with an impressive variety of serious business uses. **Dec 93**

★★★ **Apple PowerCD, Apple Computer, 408/996-1010, $400.** This extremely versatile and beautifully designed portable CD-ROM drive offers impressive audio and Photo CD features, but if you're a serious CD-ROM user, it's too slow to satisfy. **Jan 94**

★★★★ **ArtZ ADB Tablet, Wacom Technology Corp., 206/750-8882, $449.** Combining pressure-sensitive operation, manageable size, and a new pencil-thin stylus, this affordable digitizing tablet is perfect for artists looking for traditional-style control of their graphics programs. **Aug 93**

★★★ **Computer Crayon, Appoint, 510/463-3003, $49.** The kid contingent's verdict was a definite thumbs-up on this brightly colored input device that's shaped like a thick pencil. The buttons can be hard for smaller children to press, and serious computer artists should still opt for a drawing tablet. **Oct 93**

★★★★ **Coolscan LS-10e, Nikon Electronic Imaging, 516/547-4200, $2600.** Compact desktop scanner for digitizing images from 35mm transparencies is slow, but delivers images good enough for newsprint publications and some catalogs. **Dec 93**

★★★★ **Cypress PhonePro 1.2, Cypress Research Corp., 408/752-2700, $349 to $950.** By improving its integration with FaxPro and with PowerTalk and PowerShare, this powerful telephony software has greatly extended its business scope. **May 94**

★★★ **EMBARC, Embarc Communications Services, 407/364-2000, $395 plus fees.** If you're a PowerBook user who is frequently in places with no telephone and you need timely delivery of electronic news and E-mail, this portable wireless message service may prove useful, but the cost may be prohibitive to others. **Sep 93**

★★★★ **Epson ES-800C, Epson America, 310/782-0770, $1499; Macintosh interface kit $399.** Flexible 400-dpi scanner offers a range of options, including one- or three-pass scanning, plus a full-featured, easy-to-use software package. **Aug 93**

★★ **Gulliver, Appoint, 510/463-3003, $119.** This diminutive mouse is hard to hold comfortably for an extended period, but it works well on almost any surface and is an acceptable option for PowerBook users. **Oct 93**

★★ **G-Vox, Lyrrus, 215/922-0880, $399.** Hardware-software guitar-instruction package lets your Mac "hear" the notes you play on your guitar. Although the hardware works well, the software has some basic problems and doesn't live up to the hardware. **Apr 94**

★★★ **Hello Music, Yamaha Corp. of America, 714/522-9240, $449.** MIDI starter kit includes an impressive tone generator that's compatible with General MIDI Level 1 and Roland MT-32, but the included software is functional at best. **Dec 93**

★★★ **LightningScan Portable, Thunderware, 510/254-6581, $459.** PowerBook owners will find this hand scanner's modem- or serial-port connection, lightweight interface, and total portability well worth the cost, although the scanner is incompatible with some desktop Macs. **Dec 93**

★★ **Macintosh TV, Apple Computer, 408/996-1010, $2079.** As a computer, this combination computer-television-CD player is sleek but slow. You can get faster performance and better expandability from several less-expensive Performa models. **Apr 94**

★★★★ **Mirror 800 Plus Color Scanner, Mirror Technologies, 612/633-4450, $1299.** Add the NuBus JPEG board ($300) and easy-to-use 35mm transparency scanning module ($599) and to get a nifty—if slow—desktop scanning package for a reasonable price. **Jan 94**

★★★ **PenDirect ADB, FTG Data Systems, 714/995-3900, $498.** Input device lets you manipulate items on the Macintosh screen using a special stylus called a light pen. It works well, although it seems ergonomically inferior to a mouse for routine tasks. **Mar 94**

★★★ **PowerLink Presentor, E-Machines, 503/646-6699, $499.** Simple, compact Duo dock wobbles a bit when plugged in but provides fine support for a variety of displays, plus ports for ADB, floppy drive, and sound output. **Nov 93**

★★★ **PowerPlate, Technöggin, 513/321-1777, $169.95 to $299.95.** Line of long-lived, external PowerBook battery packs, each of which lets you work for three to five times as long as the usual PowerBook battery. Unfortunately, the System 7 power manager periodically alerts you that your battery is not charging and dims the screen though battery pack has hours of time left. **Mar 94**

★★★ **RCD-202, Pinnacle Micro, 714/727-3300, $3995.** Writable CD-ROM drive is good for archiving data simply and inexpensively, but it's incompatible with many hard drives. **Mar 94**

★★★ **ScanMaker 35t, Microtek, 213/321-2121, $1999.** Speedy 35mm film scanner accommodates loose film and delivers a good image, but the included software is weak. **Dec 93**

★★★ **ScanPlus Color 6000 for Mac, PlusTek USA, 408/980-1234, $749.** Small, inexpensive sheetfed color scanner is not appropriate if exact color matching is critical, but it is otherwise a good, economical option. **Sep 93**

★★★★ **ThinPack, VST Power Systems, 508/287-4600, $199.95.** External battery pack for PowerBooks is compact, with a lightweight design. It comes with handy power-management utilities. **Mar 94**

★★★ **TrakMate, Key Tronic Corp., 509/928-8000, $149.** Input device integrates a trackball into a wrist pad. While the design is interesting, it's not for everyone. **Feb 94**

★★★ **Wacom UD-1212R, Wacom Technology Corp., 206/750-8882, $749.** Graphics tablet with pressure-sensitive stylus is easy to use and highly customizable, though it's incompatible with AppleTalk and AppleTalk Remote. **May 94**

★★★★ **Yamaha YST-M10 Powered Monitor Speakers, Yamaha, 714/522-9240, $149.95.** Powered speakers have a good balanced sound and a great volume range at an outstanding price. **Apr 94**

MODEMS/NETWORK HARDWARE

★★★★ **AsantéHub 1012, Asanté Technologies, 408/435-8388, $1299.** This 12-port, 10BaseT Ethernet hub works right out of the box and is a premium device at a bargain price. **Dec 93**

★★★ **DataLink PB; Axcell Cellular Interface, Applied Engineering, 214/241-6060, $824.** If you need a full-blown office on the beach, this PowerBook cellular-modem package with automatic answering machine is a well-executed solution. Each recorded second requires 25K of disk space. **Nov 93**

★★★★★ **EtherWave, Farallon Computing, 510/814-5000, $129.** If you need to expand your network at a reasonable price with minimal fuss, get this Ethernet transceiver. Instead of providing only one 10BaseT twisted-pair jack, it includes a second jack that allows you to daisy-chain to another device through an additional 10BaseT line. **May 94**

★★★ **PerFit Port-A-Com, PerFit, 303/530-7333, $349.** Compact, ADB-powered, high-speed fax/data modem is difficult to configure, due to its Spartan and poorly organized documentation, but is still a solid product at a reasonable price. **Nov 93**

★★★ **SupraFaxModem 144PB, Supra Corp., 503/967-2400, $349.95.** If you're looking for a high-speed internal modem for your PowerBook, and you want to save a few bucks, this modem is worth considering. Disabling its fax software solved occasional transfer problems. **Nov 93**

PRINTERS

★★★ **Apple Color Printer, Apple Computer, 408/996-1010, $2349.** If you need large-format color output, but not precision color-matching, this well-built printer is a reasonable choice, although it doesn't support PostScript. **Aug 93**

★★★★ **Apple Portable StyleWriter, Apple Computer, 408/996-1010, $439.** Sleek, portable ink-jet printer weighs 4½ pounds and is a pleasure to use. It uses standard StyleWriter cartridges. **Jan 94**

★★ **Brother HJ-400, Brother International, 908/356-8880, $369.** Compact, 360-dpi ink-jet printer is fairly slow and does not allow background printing. Some large files require additional application memory to print correctly. **May 94**

★★★★ **DeskWriter 310, Hewlett-Packard, 800/752-0900, $379 to $455.** Versatile, low-cost ink-jet printer is a 4.3-pound, battery-powered portable. With its 60-page sheet feeder, it's also a great desktop printer; and with a $49 color print cartridge, it offers inexpensive three-color printing. **Mar 94**

★★★ **HP LaserJet 4ML, Hewlett-Packard, 800/752-0900, $1279.** Primarily for those of you who use a PC or work in a small, mixed-platform environment, this energy-efficient laser printer offers automatic port and language switching, and is a good buy. Its advanced PC features may not be worthwhile for those who use Macs only. **May 94**

★★★ **LaserWriter Pro 600 and 630, Apple Computer, 408/996-1010, $2099 to $2529.** From their paper handling to their print quality, these laser printers are Apple's best. Unfortunately, they don't support emulation-sensing, and thus may be less desirable for mixed-platform offices than other possibilities. **Jun 93**

★★★★ **LaserWriter Select 300, Apple Computer, 408/996-1010, $839.** Inexpensive, low-capacity printer is networkable, and an excellent value, in spite of a few weaknesses. Add a 4MB SIMM to take advantage of the printer's amazing PhotoGrade capabilities, which enable the printer to generate 91 shades of gray. **Aug 93**

★★ **LaserWriter Select 310, Apple Computer, 408/996-1010, $1099.** This big, slow printer is a true Adobe PostScript printer with both Mac and DOS ports, but it's not networkable or compatible with the Communi-

continues

Know everything that everyone on CompuServe knows.

Join CompuServe now, and you'll have access to all of our online, interactive hardware and software support forums. And we offer more forums than any other online service.

For more information about CompuServe, just mail this card, or call 1 800 848-8199.

Name _____

Company (If Applicable) _____

Address _____

City, State, Zip _____

Telephone (____) _____



CompuServe®

MacWorld/June

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

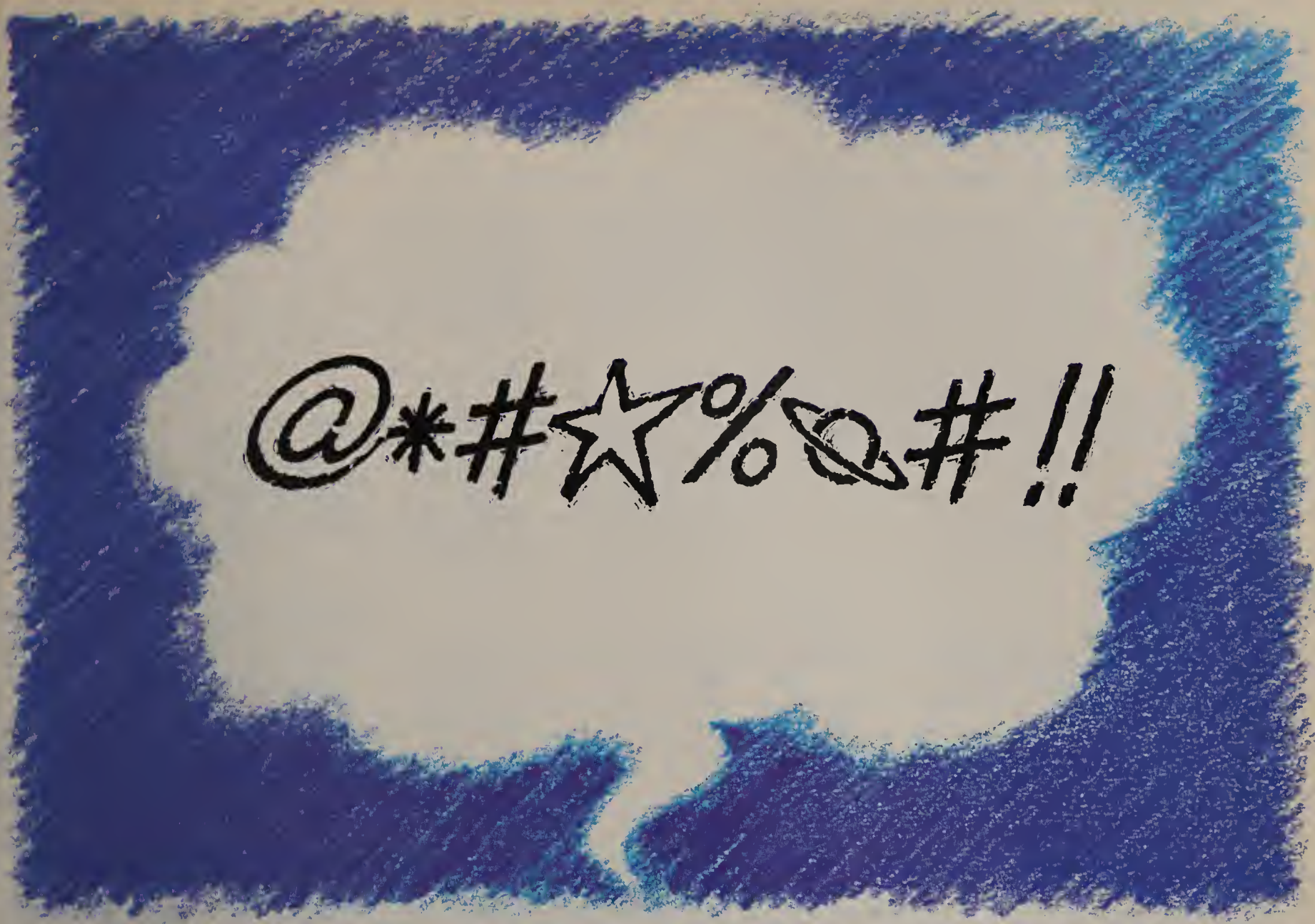
BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 407 COLUMBUS, OHIO

POSTAGE WILL BE PAID BY ADDRESSEE

CompuServe®

NEW MEMBER DEPARTMENT Mac World/June
PO BOX 20961
COLUMBUS 0H 43220-9988



Sounds like it's time to call CompuServe for hardware and software support.

As advanced as computers are these days, they still manage to bring out the primitive in us sometimes. Why not put your verbal skills to better use, with CompuServe?

We offer a whole world of support. Including hardware and software forums filled with people from all over who have faced the problems you're dealing with now. No matter how basic — or complicated — your question, you can rely on your CompuServe friends to provide an answer.

We also have representatives of the most popular hardware manufacturers and software publishers online. They'll address your problems quickly, and provide you with information that's not available in any manual.

And then there are our vast reference resources. Whether you want more in-depth information, or just to keep up to date, you can take advantage of our extensive computer libraries as well as a comprehensive collection of articles from leading industry publications.

So lower your voice — and your blood pressure — because help is on the way. For more information or to order, see your computer dealer or call 1 800 848-8199. Outside the U.S. and Canada, call 1 614 529-1349.

CompuServe®

The information service you won't outgrow.™

Circle 66 on reader service card

Star Ratings

cations Toolbox, it can't automatically switch ports, and it doesn't have adjustable paper guides. **Aug 93**

★★★★★ **LaserWriter Select 360, Apple Computer, 408/996-1010, $1599.** Low-cost, high-performance, 10 ppm printer is perfect for small LocalTalk or mixed networks. For bigger networks, consider buying more than one; they're more cost-effective than a 20-ppm printer. **Apr 94**

★★★ **MobileWriterP5, Mannesmann Tally Corp., 206/251-5524, $999.** Fast, portable printer is currently the only PostScript portable available. While the print quality is quite good on glossy laser paper, it's mediocre on inexpensive bond. **Dec 93**

★★★★ **Personal LaserWriter 320, Apple Computer, 408/996-1010, $959.** If you've been holding out for a high-quality personal laser printer that's fast enough to share over LocalTalk, the small inconveniences of this 300-dpi printer are easily outweighed by its low price, good speed, and PostScript Level 2 support. **May 94**

★★★ **Phaser 200i Color Printer, Tektronix, 503/682-7377, $5995.** This thermal-wax color printer is fast and compact, with versatile paper-handling features. TekColor image-enhancement technologies provide excellent output quality that is, however, poor on letterhead and inexpensive photocopier bond. **Aug 93**

★★ **PrintPartner 10W, Fujitsu Computer Products, 408/432-6333, $2450.** While this multiplatform printer is fast and prints clearly, many Mac users will find it frustrating as it can't print some TrueType fonts. **Jul 93**

★★★ **5mart Label Printer Pro, 5eiko Instruments, 408/922-5900, $299.95.** If you need to print only a few labels at a time, this label printer may be an expensive but good choice. It prints very quickly, and with excellent print quality. **May 94**

★★★★ **5tyleWriter II, Apple Computer, 408/996-1010, $359.** Apple's ink-jet printer retains the best features of its predecessor, but costs less. New features, such as gray-scale printing and the ability to share the printer over a network, make it even more versatile. **Jun 93**

SYSTEMS/STORAGE

★★★ **Centris 610, Apple Computer, 408/996-1010, 4/80 $1859.** Slim-design Mac uses a 20MHz 68LC040 processor at a price-to-performance ratio that comes close to competing with Windows PCs; however, its expandability is severely limited. **Jun 93**

★★★★ **Centris 650, Apple Computer, 408/996-1010, 4/80 68LC040 $2699.** Moderately priced but fast 040 system offers three expansion slots and one drive bay, and (except for the base model) has built-in Ethernet, video circuitry, and a math coprocessor. **Jun 93**

★★★★ **DataPak 105, Mass Microsystems, 408/522-1200, $949 to $1049.** Well-built 105MB SyQuest drive comes with a decent, no-frills cartridge-formatting package and a copy of 7th Heaven. The preformatted cartridges have a lifetime warranty. **Sep 93**

★★★ **EtherDock, E-Machines, 408/541-6100, $699.** Heavy-duty Duo docking option is equipped with a full set of 11 ports, including an Ethernet port. The locking mechanism is alarmingly wobbly—although reliable enough to ensure a good connection. **May 94**

★★★ **Expert Pad PI-7000, Sharp Electronics Corp., 800/993-9737, $899.** Personal digital assistant features the advantages of the Newton, in a better industrial design and at a comparative price. If the battery lasted longer and the message network were implemented, the PDA revolution could begin. **Feb 94**

★★ **HP Optical Disk Library 10LC, Hewlett-Packard, 800/752-0900, $9495.** Optical jukebox may fill the need for 10 gigabytes of online storage, but its performance is poor, and the software lacks the features needed for adequate management. **Jan 94**

★★★★ **Infinity 105 Turbo, Peripheral Land, 510/657-2211, $795 to $894.** Small, light, quiet, inexpensive 105MB SyQuest drive is ingeniously packaged and ideal for both desktop and PowerBook use. **Sep 93**

★★★ **Infinity Optical 3.5, Peripheral Land, 510/657-2211, $1999.** If you need the extra measure of permanence that magneto-optical storage provides—or a compact alternative to bulky cartridges—this drive, based on a Sony mechanism and using 3½-inch disks that store 120MB of data, deserves a look. **Jun 93**

★★★★ **LC III, Apple Computer, 408/996-1010, 4/80 $1349.** Base system comes equipped with a 25MHz 68030 processor and 512K of VRAM. This is a machine that fits the bill and the pocketbook of most home users and small-business owners. **Jul 93**

★★★ **MicroMac Plus Upgrade 5ystem, MicroMac, 714/362-1000, $499.** This 68030 accelerator for the Mac Plus requires disassembling a Plus and using the Plus system board to assemble the MicroMac system. It speeds up the Plus dramatically, and supports an included external full-page monochrome monitor. **Jun 93**

★★★★ **MultiDisk 150, Iomega, 801/778-1000, $699.** Durable cartridges are one of the strongest reasons to choose this Bernoulli removable drive. Although it's slightly more expensive than a SyQuest drive, it's fast and reliable, and the disks are competitively priced. **Jun 93**

★ **NuTek Duet, NuTek U5A Corp., 408/973-8799, $2996.** Mac workalike is both a PC and a Mac in a single box, but because of many incompatibilities and problems, the Duet is not a computer anyone should consider using for serious work. **Feb 94**

★★★ **OrangePC, Orange Micro, 714/779-2772, $1799.** NuBus board has a DOS processor, letting you have your Mac and a PC, too. It's fairly well executed, though there are some minor problems. **Oct 93**

★★★ **PLI 2.4 GB MiniArray, PLI, 510/657-2211, $4815.** Slick and elegant RAID drive worked beautifully in tests, but it costs more than other options and the QuickSCSI board is sensitive to minor SCSI problems. **Apr 94**

★★★★ **PowerBook 140 F/25 Upgrade, Digital Eclipse 5oftware, 510/547-6101, $399.** By changing the oscillators and adding an FPU, Digital Eclipse changes a PowerBook 140 into a 170, minus the active matrix screen. While the upgrade seems expensive, it's the only way to extend the viability of a 140. **Dec 93**

★★ **PowerBook 165c, Apple Computer, 408/996-1010, 4/80 $3399.** The passive matrix screen of this color notebook computer is dull and has noticeable afterimages, but if your expectations are reasonable, the speedy processor provides a pleasant work environment. **Jul 93**

★★ **PowerBook 180c, Apple Computer, 408/996-1010, 4/80 $4169.** The active matrix screen of this color notebook computer is beautiful but so small that its usefulness is very limited. **Sep 93**

★★★★ **PowerBook Duo 270c, Apple Computer, 408/996-1010, 4/240 $3099.** Notebook computer meets all the demands of power users; it weighs less than five pounds, features a color active matrix display, and offers longer battery life. The lack of a floppy drive can be inconvenient, though. **Feb 94**

★★★★ **Quadra 605, Apple Computer, 408/996-1010, 4/80 $979.** Never before has Apple offered so much performance for so little money. The performance and price of this 040-based machine match those of a standard entry-level 486SX-based Windows PC. **Mar 94**

★★★★ **Quadra 800, Apple Computer, 408/996-1010, 8/230 $4679.** Squat, yet curvy and attractive, this minitower system has fewer expansion opportunities than the Quadra 950, but just as much power. It's fast, slick, and moderately priced. **Aug 93**

★★★★ **Quadra 840AV, Apple Computer, 408/996-1010, 8/230 $4069.** Technological tour de force uses a 40MHz 68040 and an AT&T 3210 digital signal processor, and is brimming with sophisticated speech-recognition and audiovisual technology. Beware of some hardware and software incompatibilities. **Dec 93**

★★★ **5CSI MicroDock, Newer Technology, 316/685-4904, $175.** Tiny Duo docking station is just under 4½ ounces and barely 5 inches long. It adds only an ADB port and a SCSI port—but both are useful. **May 94**

★★★★ **5ledgeHammer2000FMF, FWB, 415/474-8055, $3179.** RAID drive is both fast and inexpensive. Although it can be a bit noisy when accessing data, it's a good deal. **Apr 94**

★★★ **5martStack, Envisio, 612/628-6288, 5martSource $119; 5martModules $289 to $1379.** The SmartStack line of modular storage peripherals may be neatly stacked on top of a common power supply to reduce desktop clutter and cabling problems. **Sep 93**

★★★ **Turbo 040, Day5tar Digital, 404/967-2077, $1899.** This accelerator card is equipped with the fastest 68040 chip available, and is as fast as or faster than any Macintosh in processor-intensive tasks. For the price, however, it may make more sense to trade up to a faster computer. **Dec 93**

VIDEO/DISPLAY

★★★ **AudioVision 14 Display, Apple Computer, 408/996-1010, $769.** Monitor integrates audio and video with built-in speakers that produce surprisingly rich, full-bodied sound. The display, while nice, is small for multimedia work. **Dec 93**

★★★ **Dycam Model 3, Dycam, 818/998-8008, $895.** Low-end, digital still camera is easy to use, and is a solid product if Instamatic grade gray-scale meets your image-quality requirements. **Sep 93**

★★★ **Editing Aces 5uite, RasterOps, 801/785-5750, $3899.** Video professionals can record and play back full-screen movies in 24-bit color with 16-bit CD-quality sound with these products. Despite flaws, this package represents a step forward in QuickTime technology. **Nov 93**

★★★ **Intellicolor Display/20, Radius, 408/434-1010, $3199.** Although with its exceptional brightness and clarity this monitor would be a fine addition to any designer's desk, the included Intellicolor software, which lets you control the settings of your display, doesn't offer much added value. **Apr 94**

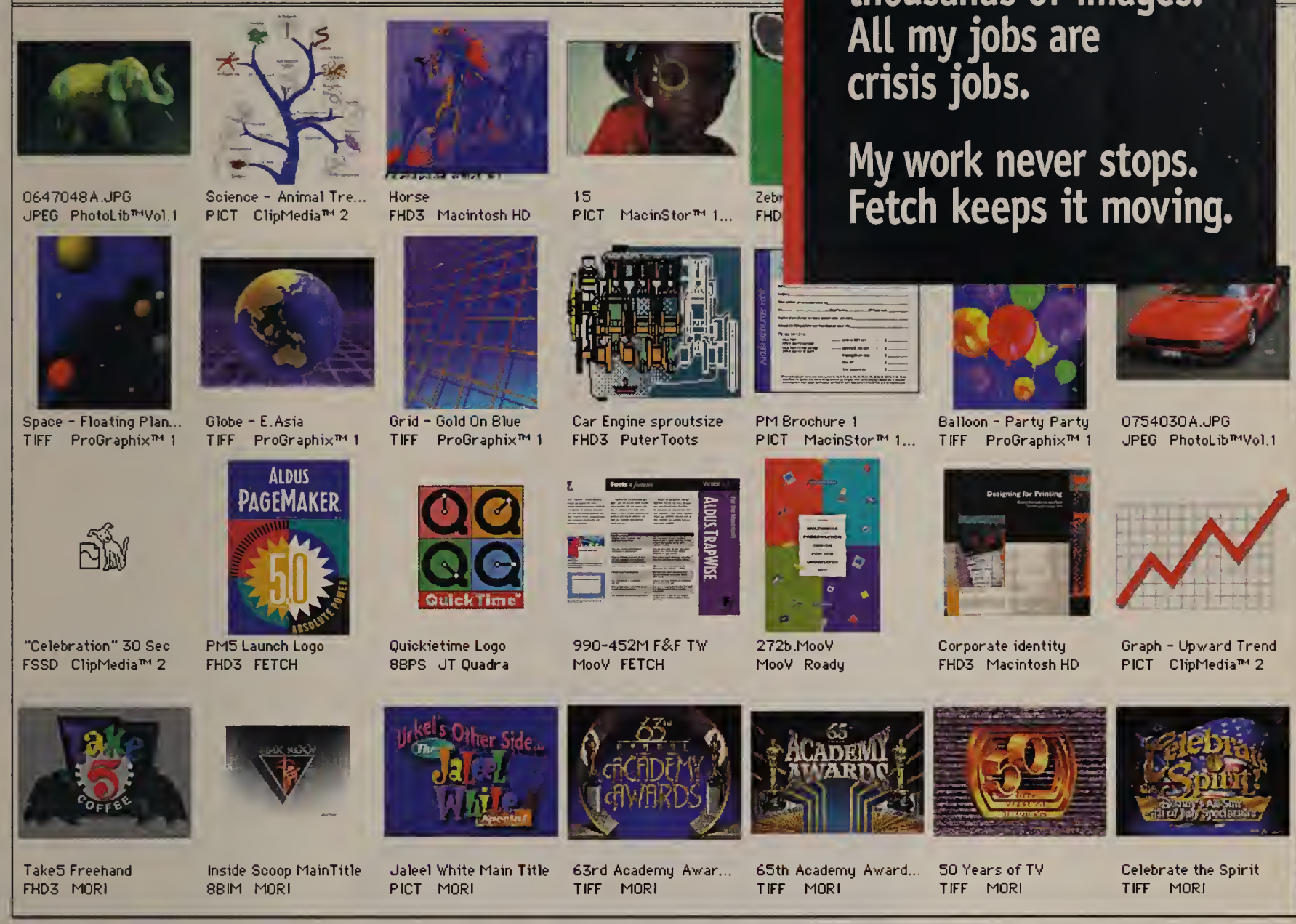
★★★★ **MovieMovie, 5igma Designs, 510/770-0100, $349.** This 7-inch NuBus video-capture board may be what you've been waiting for. The price is right, and the addition of on-board audio input is a plus, even if it is only mono. **Dec 93**

★★★ **PaintBoard Turbo, RasterOps, 408/562-4200, $1499.** Midrange video board supports 24-bit color on monitors up to 17 inches and resolutions as high as 1024 by 768 pixels. If you can live without changing resolutions on the fly, it's a reasonably good deal. **Oct 93**

★★★ **VideoToolkit 2.0.1, Abbate Video, 508/376-3712, $279.** Despite a few rough edges, this is an attractive, inexpensive solution for those who need to catalog and edit videotapes on a budget. **Sep 93** m

I need to manage graphics, documents, thousands of images. All my jobs are crisis jobs.

My work never stops. Fetch keeps it moving.





"Why didn't anybody think of this before?"

David Piña knows Aldus® Fetch® for Macintosh.

Because C. David Piña Design *relies* on it.

Winning numerous awards for such clients as Walt Disney® and the Academy Awards®, David and his staff have to deal with multiple projects, thousands of digital images, and dozens of design variations—files, documents, artwork, photos, logos, video clips, sounds, graphics, templates.

And Aldus Fetch is the seamless, quick-access bridge between all of them.

"We open it first thing in the morning, and it links all our applications with all our graphics and text elements for all our projects—and keeps our business moving all day long."

Fetch retrieves creative work from one job in one application and places it in another. So you don't have to re-create what you've already created.

Fetch puts everything right in front of you—visually. You can browse through galleries of "thumbnails"—more than 100,000 images in a single catalog. In any file format—EPS, PICT, TIFF™, JPEG, QuickTime, Kodak Photo CD, GIF, and many more. For any of your favorite applications—Aldus PageMaker®, Aldus Persuasion®, Aldus FreeHand®, Adobe Photoshop, QuarkXPress, you name it.

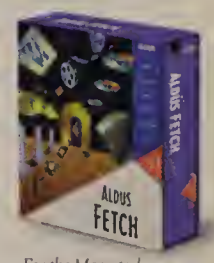
Fetch lets you catalog, browse, search, preview, retrieve, edit, and reuse materials quickly, efficiently, and cost-effectively. So you have instant access to all your work, whatever it is, wherever you've done it.

Whether you choose the standard-setting multiuser Workgroup Version that shares files across a network or the new Single-user Version that provides an affordable alternative for individual graphics professionals, Fetch puts *everything* within reach.

So reach for it. See your favorite Aldus reseller *today*. Or call us and we'll send you more information on how Fetch can keep *your* business moving.

Call toll-free (800) 685-3663.

ALDUS® FETCH™



For the Macintosh

Because your work never stops.

MacUser Eddy Award
MacWorld World Class Award
MacWorld Editors Choice Award

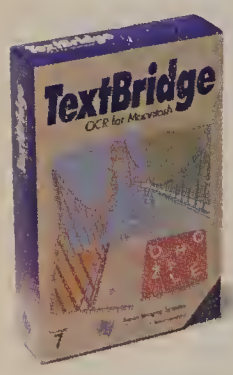
ALDUS® Aldus Corporation 411 First Avenue South Seattle, WA 98104-2871 (206) 622-5500 fax (206) 343-3360

This ad was created with Aldus PageMaker 5.0 and Aldus Fetch 1.2. ©1994 Aldus Corporation. All rights reserved. Aldus, the Aldus logo, Fetch, PageMaker, Aldus FreeHand, and Persuasion are registered trademarks and TIFF is a trademark of the Aldus Corporation. "Take 5" ©Take 5 Coffee; "Inside Scoop" ©Imagination Productions; "The Jaleel White Special" ©American Broadcasting Company; "The 63rd Annual Academy Awards" ©A.M.P.A.S.®; "The 65th Annual Academy Awards" ©A.M.P.A.S.®; "50 Years of Television" ©CBS Network; "Celebrate the Spirit" ©The Walt Disney Company. Other product and company names may be trademarks or registered trademarks of other companies, and are used only for explanation and to the owner's benefit, without intent to infringe.

Although TextBridge™ OCR software is easier to use, less expensive, and often more accurate, OmniPage® still has its uses.



In a recent independent test on a wide variety of documents, TextBridge OCR provided more accurate recognition on average than OmniPage Professional.



Yet TextBridge is only 1/7th the price of OmniPage Professional—$99 vs. $695.

Available in both PC and Mac versions, TextBridge works with most popular word processing applications, fax modems and scanners (including TWAIN support).

So try TextBridge. Of course, if you want to spend an extra $596, you can just coast along with OmniPage Professional.

To order TextBridge, call 1-800-248-6550 ext.3

Xerox Imaging Systems
A Xerox Company

Benchmark studies referenced tested TextBridge 2.0 and OmniPoge Profesianal 5.0. Prices referenced are U.S. suggested retail prices as of 3/1/94. © 1994 Xerax Imaging Systems. TextBridge is a trademark of Xerax Imaging Systems, Inc. 9 Centennial Drive, Peabody MA 01960 Telephane: 508-977-2000. OmniPage is a registered trademark of Caere Corporation.

Circle 100 on reader service card

Streetwise Shopper

SPECIAL HARDWARE AND SOFTWARE BUYING OPPORTUNITIES

Selected and edited by Charles Barrett

The following product listings include time-sensitive promotions being sponsored by Macintosh vendors and their resellers, as well as long-term price reductions and bundling arrangements. Each listing indicates which products have been awarded a star rating in *Macworld*'s *Reviews* (products rated ★★ or lower are not eligible for inclusion), have been selected as an Editors' Choice, or have won a World-Class award. In some cases, the editorial evaluation quoted is for an earlier product version.

When placing an order, please mention that you saw the offer in *Macworld*. Should any problems arise, contact the *Streetwise Shopper* editor by fax (415/442-0766), phone (415/978-3241), or mail (*Macworld,* 501 Second St., San Francisco, CA 94107).

Vendors and resellers desiring to have products and services included in this section are encouraged to contact the *Streetwise Shopper* editor with particulars.

BUNDLES

Living Desktop 1.0 + EAC Online Connection Kit Mantis Development is offering this $94.95 Pixel Pattern bundle free (except for $5 credit-refunded processing fee) to all online service users. Living Desktop provides automated desktop-background customization in the Pixel Pattern graphic format; it comes with 150 patterns, plus the option to upgrade to version 2.0 for $19.95. The Electronic Artists Consortium Online Connection Kit (which includes EAC membership for one year) gives EAC members computerized access to Pixel Pattern artwork plus free and discounted graphics software. For further details, call 800/230-6434. *Offer expires 8/5/94.*

ScanJet IIp + WordScan 1.1 Hewlett-Packard is offering a free copy of Calera Recognition Systems' $295 WordScan OCR software (Jun 92 ★★★ for version 1.0) to buyers of its $599 ScanJet IIp 8-bit flatbed gray-scale scanner (1993 World-Class; Aug 92 ★★★★), the price of which has been lowered by more than 30 percent. For more information, call 800/722-6538.

TelevEyes/Pro + Action SE Digital Vision is including a special version (limited to six templates, edited-down documentation, and no clip media) of Macromedia's $495 Action multimedia-integration program (Mar 93 "First-Time Authoring" Editors' Choice; Feb 93 ★★★★ for version 1.0) with its $799.95 computer-to-TV video-scan converter with genlock for output to flicker-free composite video or S-Video. Call 800/346-0090 to order, or for more information.

WriteNow 4.0 + Correct Grammar 3.0 + Calendar Creator 1.0 + KeyFonts The Mac Zone is offering a software bundle (# 99045) consisting of WordStar International's $119.95 WriteNow word processor (Jun 94 ★★★★), the Writing Tools Group's $79.95 Correct Grammar, Spinnaker Software's $69.95 Calendar Creator, and Softkey's $59.95 KeyFonts for Macintosh collection of 100 new typefaces. Available for $99.92 by calling 800/436-0606. *Offer not to expire before 6/30/94.*

COMPETITIVE UPGRADES

PowerPrint 2.5 GDT Softworks is offering this $149 printer-driver utility (Sep 93 "Maximize Your Printer" Editors' Choice for initial release) for $75 to registered users of competitive products such as MacPrint and Grappler IIsp. PowerPrint lets more than 1000 PC-based printers become Mac-compatible. For more information, call 800/663-6222.

Redux Deluxe 2.5 Inline Software is offering this $79.95 backup software (Jan 94 ★★★ for version 2.0.2) for $40 to owners of competitive backup programs. This upgrade now includes Aladdin Systems' $59.95 SpaceSaver, an extension of StuffIt Deluxe (Aug 93 ★★★★) that provides background compression and automatic decompression. Call 800/453-7671 for more information.

DISCOUNTS/REBATES/SPECIAL OFFERS

Apple Workgroup Server + PowerPC Logic Board Apple Computer is offering a $500 mail-in rebate to customers who purchase either a Workgroup Server 60 or 80 before 4/30/94, plus a Workgroup Server PowerPC logicboard upgrade before 10/31/94 once it becomes available this summer. A mail-in rebate form can be obtained from authorized resellers. *Offer expires 11/15/94.*

ArtPack Olduvai is offering this "best-of" assortment, which has been selected from the ArtFont and ArtClips collections, free of charge (except for S&H). Valued at $59, it includes six display fonts and 25 professionally created images in EPS format. For more information, call 800/548-5151. *Offer expires 6/30/94.*

Compton's Interactive Encyclopedia Compton's NewMedia has reduced the 1994 edition price of this CD-ROM encyclopedia, which includes video clips as well as photos and reference materials, from $395 to $149.95. For further information and to order, call 800/862-2206.

CompuServe Information Service CompuServe has cut its hourly rates for online service by 40 percent. For 9600-bps and 14,400-bps service, the rate drops from $16 to $9.60 per hour; for 1200-bps and 2400-bps service, from $8 to $4.80. For more information, call 800/848-8199.

EtherWave AAUI Transceivers Farallon Computing is offering Power Macintosh owners up to two $129 EtherWave AAUI transceivers for $89 each. These transceivers provide 10BaseT Ethernet network connectivity and allow for daisy-chain configuration. Call 800/795-7761, ext. 1, for proof-of-purchase requirements. *Offer expires 6/30/94.*

IntelliColor Display/20; PrecisionColor Display/20v Radius has reduced prices for two of its 20-inch color monitors. The IntelliColor Display/20 drops from $3199 to $2299; the PrecisionColor Display/20v, from $2199 to $1999. Call 800/227-2795 for reseller information.

Macintosh Product Registry Redgate Communications is offering this comprehensive registry in either print (released quarterly) or CD-ROM (released semiannually) format. The registry currently contains more than 6800 in-depth descriptions of Macintosh third-party products. An initial CD-ROM release is available for $59, with semiannual updates priced at $39 each. An annual subscription to the print version is $40; volumes can be purchased individually for $14.95 each. Call 800/333-8760 to order.

Microsoft Plus Microsoft is offering extended services and product discounts to registered users of its products through this not-for-profit program. Services include express access to phone support service for Microsoft applications, a productivity-oriented *Microsoft Plus* bimonthly journal, and access to the Microsoft Plus Forum on CompuServe (with 30 days of no-charge connect time). Annual membership is $39. Registered Microsoft product owners can enroll by calling 800/999-5505.

MultiClip 2.1.7 Olduvai continues to offer this next-to-most-recent version of its $149 Clipboard/Scrapbook-replacement utility direct (800/548-5151) for $9.95 (plus S&H). Purchase includes a free MultiArt collection of clip art and sounds, plus a special MultiClip 3.0 upgrade price of $39.95. *Offer expiration extended to 6/30/94.*

Mutoh Plotters/Projection Panels Mutoh America has reduced the prices of its XP-500 series of pencil/pen plotters and ViewPoint color LCD projection panels. The XP-511 (D-size, sheet-feed) plotter drops from $4800 to $3495; the XP-510 (E-size, sheet-feed), from $6300 to $4495; and the XP-510R (E-size, roll-feed), from $7595 to $5695. The VP-100 panel goes from $5595 to $3995; the VP-200, from $8995 to $7595. The VP-300 LCD projector drops from $13,495 to $9995. Call 708/952-8880 for more information.

NetWare 4 Novell has extended an offer whereby customers who purchase and register NetWare 4 by 12/31/94 automatically receive all updates and upgrades at no additional charge through 3/31/95. Enhancements are to include operating system updates, utilities for building NetWare Directory Services directory trees, and bindery synchronization tools for more tightly integrating NetWare 4 with NetWare 3. *Offer expires 12/31/94.*

Newton Intelligent Messaging Lease Apple Computer is offering a Newton MessagePad personal digital assistant (Dec 93 ★★★), a Newton Messaging Card, and an Apple Wireless Messaging Service lease program through BellSouth's MobileComm at $49.95 per month for local coverage (includes local paging service and up to 100 text messages) and $69.95 per month for nationwide coverage (up to 125 text messages). At the end of a 24-month lease, customers may purchase the MessagePad and Messaging Card for $89, or continue the lease with a $10 monthly discount. To order service, call 800/474-6374. m

RASTEROPS PAINTBOARD 24-BIT DISPLAY SOLUTIONS MAKE QUITE AN IMPRESSION.



No matter how well you've mastered technique, the wrong display can obscure the subtleties. That's why RasterOps makes display solutions for every style and budget.

Degas undoubtedly would've been impressed with the 20T Multiscan Color Display for picture-perfect accuracy, paired with the PaintBoard Professional™ and RasterOps DSPro,™ a Photoshop™ accelerator daughtercard. On the other hand, Mondrian might have found the RasterOps 20/20 Multimode Color Display and PaintBoard Lightning™ accelerated graphics card a perfect fit for his straight lines and sparse color.

Both would be able to choose from the same 16.7 million color palette. And the competitive price means neither has to be a starving artist.

Portrait of an industry leader

The first company to deliver Macintosh® 24-bit color is a world leader in workstation-performance color. We're in our fourth generation of QuickDraw™ acceleration technology—achieving performance increases of up to 4400%. Check the chart below, and you'll find a display solution that brings lifelike—and fast—color to your desktop.



The PaintBoard™ line offers single-slot photorealistic 24-bit big-canvas color, multiple resolutions and reliable acceleration for every graphic artist's needs.

There's an impressive display at a dealer near you. To find out where, call **1-800-SAY-COLOR.**

	PAINTBOARD 24-BIT COLOR GRAPHIC ACCELERATOR CARDS			
	PROFESSIONAL $2,199*	TURBO XL $1,399	TURBO $1,199	LIGHTNING $999
RASTEROPS COLOR DISPLAYS				
RasterOps 21" Color [1152 x 870] • $2,749	■	■		
RasterOps 20T Trinitron Multiscan Color [1024 x 768] • $2,869	■	■	■	■
RasterOps 20/20 Multimode Color [1024 x 768] • $1,869	■	■	■	■
RasterOps Sweet 16 Color [832 x 624] • $1,099	■	■	■	■

■ High-end color design solutions ■ Cost-effective high-performance ■ Most affordable 24-bit color solutions

RASTEROPS®

2500 Walsh Avenue • Santa Clara, California 95051

©1994 RasterOps Corporation. All rights reserved.
DSPro, PaintBoard Professional, Turbo, Turbo XL and Lightning are trademarks of RasterOps, and all trademarks and tradenames are property of their respective owners.
*Price does not include RasterOps DSPro card. All prices are US suggested retail.

Circle 191 on reader service card

Macworld

Advertiser Index

Say you saw it in Macworld. To purchase products advertised in this issue call the phone numbers below or use the reader service number for our FastFacts Product Information Card located after the product index.

Page No.	Advertiser	Reader Srvc. No.	Phone
179	Agfa/Scanner	158	800/685-4271
12	Agio	—	800/688-2446
195	Aldus Corporation	—	—
6-217	Alliance Peripheral Systems	62	800/874-1428
50	American Power Conversion	72	800/788-2208
8	Anthro Corporation	—	800/325-3841
20	Apple Computer	—	—
47	Apple Computer	—	—
49	Apple Computer	—	—
51	Apple Computer	—	—
61	Apple Computer	—	—
7-109	Apple Computer	—	—
32-33	Apple Computer	—	—
70-73	Apple Computer	—	—
30	Attain Corporation	6	617/776-1110
8-219	BottomLine Distribution	63	512/472-4956
-125N	Caere Corporation	69	800/535-SCAN
147	Canon USA	110	800/OK-CANON
267	CDROM Expo	—	617/361-8000
82	Central Point	93	800/277-3873
30	Charles River Analytics Inc.	18	800/913-3535
148	Chinon America	64	800/441-0222
180	Citizen	185	800/4-PRINTERS
4-227	ClubMac	96	800/CLUBMAC
9	Communication Intelligence Corporation	—	800/888-9242
193	CompuServe	66	800/848-8199
92-93	Computer Discount Warehouse	2	800/861-4CDW
46	Connectix	189	800/950-5880
23	Contemporary Cybernetics Group	188	800/873-9000
11	Corel Corporation	78	800/836-3729
220	CRA Systems Incorporated	20	800/375-9000
171	CTX International	38/39	909/595-6146
44	Dantz Development	26	—
53	DataViz	79	800/733-0030
162	Dayna Communications	161	800/443-2962
219	DGR Technologies	65	800/235-9748
235	Digital Axis	83	800/747-7555
235	Direct Connections	121	800/572-4305
72-273	Educorp	157	800/843-9497
12	Engineered Software	12	910/299-4843
24-25	Epson	—	800/BUY-EPSON
12-213	Express Direct	81	800/765-0020
16-117	Focus Enhancements	201	800/538-4888
168	Fujitsu	202	800/831-4094
68	GDT Softworks	32/42	800/663-6222
54-55	Global Village	156	800/736-4821
41	Graphsoft	46	410/290-5114
155	HSC Software	5	310/392-8441
144	Insignia Solutions	68	800/848-7677
52	Inspiration Software	—	800/877-4292
2 - 3	Intel Corporation	—	800/364-0919
BC	Kensington Microware Ltd.	—	800/535-4242
15-19	La Cie	52	800/999-1422
123	Lasermaster Corporation	43	800/950-6868
149	Letraset USA	255	800/343-TYPE
76	MacAcademy	106	800/527-1914
79-81	MacConnection	—	800/800-3333
203-210	MacMall	131	800/222-2808
222-223	MacNews	172	800/723-7744
214	MacProducts	175	800/622-8721
14	MacTable/ScanCo	—	800/722-6263
230-231	MacWarehouse	150	800/255-6227
156-159	Macworld Boston Expo	—	617/361-8000
229	MegaHaus	245	800/786-1184
IFC-1	Microsoft	—	—
34	Microtek Lab	287	800/654-4160
128-129	Mirror Technologies	58	800/643-4142
165	Mitsubishi Display Products	261	800/243-2515
228	Mobius Technologies Inc.	109	800/800-4334
166	Momentum Inc.	—	—
75	Motorola	—	—
6-7	NEC Technologies	25	800/NEC-INFO
IBC	NEC Technologies	16	800/NEC-INFO
172	Now Software	—	800/237-2078
10	nView Corp.	117	800/736-8439
22	Orange Micro Inc.	33	714/779-2772
29	Pinnacle Micro Inc.	178	800/553-7070
26	Pixar	13	800/888-9856
232	Power City Corporation	200	800/3POWER2
14	PrairieSoft, Inc.	269	515/225-3720
233	ProDirect	135	800/524-9952
153	Proxima Corporation	47	800/447-7694
150	QMS Incorporated	—	800/392-7559
268-270	Quality Computers	263	800/777-3642
124-125S	Radius	146	800/227-2795
66	Radius	14	800/227-2795
42	RasterOps	90	800/SAY-COLOR
198	RasterOps	191	800/SAY-COLOR
221	Relysis/MacNews	262	800/756-5777
62	Seiko	149	—
175-176	Signature Software	300	—
141	Specular	41	800/433-7732
191	Statsoft Incorporated	99	918/583-4149
48	Strata	114	800/869-6855
13	SuperMac	88	800/334-3005
211	SuperMicro	126	800/352-3415
64	SyQuest	249	800/245-2278
167	Technöggin	94	800/305-7936
189	Tektronix	143	800/835-6100
85	Texas Instruments	—	800/527-3500
87	Texas Instruments	265	800/527-3500
89	Texas Instruments	266	800/527-3500
91	Texas Instruments	267	800/527-3500
215	Third Wave	186	800/624-9307
28	VST Power Systems	73	508/287-4600
102-103	Wordperfect Corporation	—	800/526-7820
196	Xerox Imaging Systems	100	800/248-6500

TURN TO THE MACWORLD SHOPPER ON PAGE 236 TO FIND ADDITIONAL ADVERTISERS.

InfoFAX

For instant faxed back information,

call 1-800-234-0455

enter extension 502 for QMS Incorporated and extension 505 for Now Software

Macworld

Product Index

A quick and easy product index from Macworld. Simply use this index to find the page or advertiser of the products which interest you. Then, use the reader service number for our FastFacts Product Information Card located on the following page.

Page No.	Advertiser	Reader Srvc. No.
SOFTWARE		
BUSINESS		
20	Apple Computer	—
51	Apple Computer	—
32-33	Apple Computer	—
52	Inspiration Software	—
IFC-1	Microsoft	—
14	PrairieSoft, Inc.	269
175-176	Signature Software	300
191	Statsoft Incorporated	99
102-103	Wordperfect Corporation	—
CAD/CAM		
12	Engineered Software	12
41	Graphsoft	46
CD ROM		
61	Apple Computer	—
11	Corel Corporation	78
272-273	Educorp	157
COMMUNICATION		
53	DataViz	79
DATA MANAGEMENT		
195	Aldus Corporation	—
EDUCATIONAL		
268-270	Quality Computers	263
FONTS		
149	Letraset USA	255
175-176	Signature Software	300
GRAPHICS/DTP		
51	Apple Computer	—
11	Corel Corporation	78
155	HSC Software	5
26	Pixar	13
141	Specular	41
48	Strata	114
MISCELLANEOUS		
68	GDT Softworks	32/42
52	Inspiration Software	—
MULTIMEDIA		
195	Aldus Corporation	—
26	Pixar	13
13	SuperMac	88
NETWORKING		
14	PrairieSoft, Inc.	269
OCR		
124-125N	Caere Corporation	69
196	Xerox Imaging Systems	100
STATISTICAL		
191	Statsoft Incorporated	99
UTILITIES		
82	Central Point	93
30	Charles River Analytics Inc.	18
46	Connectix	189
44	Dantz Development	26
68	GDT Softworks	32/42
144	Insignia Solutions	68
172	Now Software	—
WORD PROCESSING		
102-103	Wordperfect Corporation	—
HARDWARE		
BOARDS		
22	Orange Micro Inc.	33
124-125S	Radius	146
66	Radius	14
42	RasterOps	90
198	RasterOps	191
CD ROM		
272-273	Educorp	157
IBC	NEC Technologies	16
211	SuperMicro	126
COMPUTER SYSTEMS		
20	Apple Computer	—
32-33	Apple Computer	—
70-73	Apple Computer	—
218-219	BottomLine Distribution	63
220	CRA Systems Incorporated	20
219	DGR Technologies	65
212-213	Express Direct	81
2 -3	Intel Corporation	—
215	Third Wave	186
DIGITIZERS/SCANNERS		
47	Apple Computer	—
49	Apple Computer	—
124-125N	Caere Corporation	69
116-117	Focus Enhancements	201
179	Agfa/Scanner	158
235	Digital Axis	83
24-25	Epson	—
34	Microtek Lab	287
128-129	Mirror Technologies	58
221	Relysis/MacNews	262
HARD DISKS/STORAGE		
148	Chinon America	64
29	Pinnacle Micro Inc.	178
216-217	Alliance Peripheral Systems	62
218-219	BottomLine Distribution	63
224-227	ClubMac	96
23	Contemporary Cybernetics Group	188
219	DGR Technologies	65
235	Direct Connections	121
15-19	La Cie	52
214	MacProducts	175
229	MegaHaus	245
232	Power City Corporation	200
233	ProDirect	135
211	SuperMicro	126
64	SyQuest	249
DISPLAY		
107-109	Apple Computer	—
220	CRA Systems Incorporated	20
171	CTX International	38/39
235	Digital Axis	83
222-223	MacNews	172
128-129	Mirror Technologies	58
165	Mitsubishi Display Products	261
228	Mobius Technologies Inc.	109
10	nView Corp.	117
153	Proxima Corporation	47
13	SuperMac	88
EXPANSIONS/UPGRADES		
228	Mobius Technologies Inc.	109
INPUT DEVICES		
9	Communication Intelligence Corporation	—
BC	Kensington Microware Ltd.	—
MICROPROCESSOR		
75	Motorola	—
MISCELLANEOUS		
9	Communication Intelligence Corporation	—
166	Momentum Inc.	—
MODEMS		
54-55	Global Village	156
NETWORKING		
50	American Power Conversion	72
162	Dayna Communications	161
166	Momentum Inc.	—
POWERBOOKS		
BC	Kensington Microware Ltd.	—
167	Technöggin	94
28	VST Power Systems	73
PRINTERS		
147	Canon USA	11
180	Citizen	18
123	Lasermaster Corporation	4
6-7	NEC Technologies	2
150	QMS Incorporated	—
62	Seiko	14
189	Tektronix	14
87	Texas Instruments	26
89	Texas Instruments	26
91	Texas Instruments	26
VIDEO		
124-125S	Radius	14
66	Radius	1
42	RasterOps	9
SERVICES		
TRAINING		
76	MacAcademy	10
ON LINE		
193	CompuServe	6
TRADESHOWS/CONFERENCES		
267	CDROM Expo	-
156-159	Macworld Boston Expo	-
ACCESSORIES		
FURNITURE		
12	Agio	-
8	Anthro Corporation	-
14	MacTable/ScanCo	-
MISCELLANEOUS		
14	MacTable/ScanCo	-
MAIL ORDER		
216-217	Alliance Peripheral Systems	6
224-227	ClubMac	9
92-93	Computer Discount Warehouse	
235	Direct Connections	12
212-213	Express Direct	8
79-81	MacConnection	-
203-210	MacMall	13
222-223	MacNews	17
214	MacProducts	17
230-231	MacWarehouse	19
229	MegaHaus	24
232	Power City Corporation	20
233	ProDirect	13
268-270	Quality Computers	26
221	Relysis/MacNews	26
215	Third Wave	18

Macworld

JUST FOR YOU. FREE PRODUCT INFORMATION FROM MACWORLD.

There's no cost or obligation. We even pay the postage! Simply fill in the questionnaire, then circle the numbers on the card below for the products that interest you. Numbers for advertised products can be found in the ad and in both the Product Index and Ad Index. Fold card and mail. No staples please.

FASTFAX
For faster results just fax this sheet to +1-413-637-4343. Please indicate your fax number where indicated.

Please answer these questions so that we may better serve you.

A. Including yourself, approximately how many people are employed at your entire work-site (i.e., employees in your office, building, or cluster of buildings)? (Check one.)

- 01 ❑ 1000+
- 02 ❑ 999 - 100
- 03 ❑ 99 - 25
- 04 ❑ Under 25

B. Which of the following computers are installed at this entire work-site? (Check all that apply.)

- 05 ❑ Apple Workgroup Servers/ Mac Quadra-series
- 06 ❑ Mac Centris-series/II-series/LC III/ Performa 600/450/SE 30
- 07 ❑ Mac LC/LC II/Performa 430/405/ 400/200/Classic-series/SE/Plus/ 512K/128K/Portable
- 08 ❑ Mac PowerBook-series/Duo-series

C. What is the total number of Macs installed at this entire work-site? (Check one.)

D. For how many Macintosh computers within this entire work-site do you have purchase involvement for products and/ or services? (Check one.)

	C	D
500+	❑ 09	❑ 15
499 - 100	❑ 10	❑ 16
99 - 50	❑ 11	❑ 17
49 - 10	❑ 12	❑ 18
9 - 1	❑ 13	❑ 19
None	❑ 14	❑ 20

E. In which ways are you ever involved in purchase decisions for Macintosh products at this entire work-site? (Check all that apply.)

- 21 ❑ Initiate/Determine need for product/capabilities/features
- 22 ❑ Evaluate, recommend, or approve brands/models
- 23 ❑ Evaluate, recommend, or approve purchase source
- 24 ❑ Authorize purchases

F. Over the next 12 months, how much will this entire work-site spend on Macintosh products and/or services? (Check one.)

- 25 ❑ $1 million or more
- 26 ❑ $999,999 – $500,000
- 27 ❑ $499,999 – $100,000
- 28 ❑ $99,999 – $50,000
- 29 ❑ $49,999 – $10,000
- 30 ❑ Under $10,000

G. Considering the entire work-site, which of the following Macintosh hardware and software products are currently installed? (Check all that apply.)

- 31 ❑ Business software (Word processing, spreadsheet, database, etc.)
- 32 ❑ Graphics/publishing software
- 33 ❑ Monitors/displays
- 34 ❑ Printers/scanners
- 35 ❑ Networking/communications hardware and/or software
- 36 ❑ Multimedia/AV hardware and/or software
- 37 ❑ Mobile computing products (PowerBooks, peripherals, software, etc.)

H. What is your primary job function? (Check one.)

- 38 ❑ Computer Reseller/VAR/VAD
- 39 ❑ MIS/DP/IS/Network Management
- 40 ❑ Engineering
- 41 ❑ R&D/Scientific
- 42 ❑ Corporate/General Management
- 43 ❑ Accounting/Finance
- 44 ❑ Marketing/Sales/PR/ Communications
- 45 ❑ Art/Design/Creative Services

Thank You!

Please print or type all information.

Title_____

Co._____

Phone_____

Fax_____

Free Product Information

1	2	3	4	5	151	152	153	154	155
6	7	8	9	10	156	157	158	159	160
11	12	13	14	15	161	162	163	164	165
16	17	18	19	20	166	167	168	169	170
21	22	23	24	25	171	172	173	174	175
26	27	28	29	30	176	177	178	179	180
31	32	33	34	35	181	182	183	184	185
36	37	38	39	40	186	187	188	189	190
41	42	43	44	45	191	192	193	194	195
46	47	48	49	50	196	197	198	199	200
51	52	53	54	55	201	202	203	204	205
56	57	58	59	60	206	207	208	209	210
61	62	63	64	65	211	212	213	214	215
66	67	68	69	70	216	217	218	219	220
71	72	73	74	75	221	222	223	224	225
76	77	78	79	80	226	227	228	229	230
81	82	83	84	85	231	232	233	234	235
86	87	88	89	90	236	237	238	239	240
91	92	93	94	95	241	242	243	244	245
96	97	98	99	100	246	247	248	249	250
101	102	103	104	105	251	252	253	254	255
106	107	108	109	110	256	257	258	259	260
111	112	113	114	115	261	262	263	264	265
116	117	118	119	120	266	267	268	269	270
121	122	123	124	125	271	272	273	274	275
126	127	128	129	130	276	277	278	279	280
131	132	133	134	135	281	282	283	284	285
136	137	138	139	140	286	287	288	289	290
141	142	143	144	145	291	292	293	294	295
146	147	148	149	150	296	297	298	299	300

Free Macworld Shopper Information

401	402	403	404	405	501	502	503	504	505
406	407	408	409	410	506	507	508	509	510
411	412	413	414	415	511	512	513	514	515
416	417	418	419	420	516	517	518	519	520
421	422	423	424	425	521	522	523	524	525
426	427	428	429	430	526	527	528	529	530
431	432	433	434	435	531	532	533	534	535
436	437	438	439	440	536	537	538	539	540
441	442	443	444	445	541	542	543	544	545
446	447	448	449	450	546	547	548	549	550
451	452	453	454	455	551	552	553	554	555
456	457	458	459	460	556	557	558	559	560
461	462	463	464	465	561	562	563	564	565
466	467	468	469	470	566	567	568	569	570
471	472	473	474	475	571	572	573	574	575
476	477	478	479	480	576	577	578	579	580
481	482	483	484	485	581	582	583	584	585
486	487	488	489	490	586	587	588	589	590
491	492	493	494	495	591	592	593	594	595
496	497	498	499	500	596	597	598	599	600

❑ Check box and fill in the appropriate information to subscribe to Macworld. You will be billed $24.00 for a 1-year (12 issue) subscription (U.S. only).

Expires August 5, 1994 X1 June 1994

50% RECYCLED PAPER 10% Post Consumer Waste

Please print or type all information.

Name _____

Address _____

City _____

State _____ Zip _____

FREE PRODUCT INFORMATION.

Get valuable information about the products that interest you. There's no cost; no obligation. Just fill out both sides of this FASTFACTS Information form. Circle the numbers for the desired products. Then mail the card. We pay the postage! For even faster results fill out and send the card via our FASTFAX.

Now fast... get the facts, the competition's gaining on you.

Macworld

FOLD HERE AND CLOSE WITH TAPE. DO NOT STAPLE!

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 215 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

Macworld

Reader Service Department
P.O. Box 5299
Pittsfield, MA 01203-9906

FREE FEDERAL EXPRESS

*On your first order with MacMall!**
$3.00 shipping on future orders!

And No Credit Card Surcharges!

CREATIVE COMPUTERS
MacMall
YOUR MAC SUPERSTORE!™

ORDER TOLL FREE
800-222-2808

Call us for all your Apple Macintosh® Needs!

SUPER BUY!

THE HP DESKWRITER
300 DPI InkJet Printer



- 35 Scalable Fonts
- Built-in print spooler
- Three-year limited warranty

INCREDIBLE! $198

2015

Brand new! Limited Supply – Good while supplies last.

HEWLETT® PACKARD
AUTHORIZED RESELLER

THE HEWLETT PACKARD
DESKWRITER 520
INKJET PRINTER



NEW PRODUCT

HP's most affordable high-quality printer

- Clear, sharp 600x300 dpi professional quality output – HP's exclusive Resolution Enhancement technology
- Grayscale printing for dramatic black graphics
- 35 TrueType scalable fonts
- AppleTalk and serial interfaces

$289

63820

THE HP DESKWRITER 550C
Color InkJet Printer



- 300 DPI color output
- Tri-color ink cartridge
- 35 scalable fonts
- Three-year limiteed warranty

Brand new! Limited Supply. Good while supplies last

$489

60746

Lowest price on a HP color inkjet ever!!

THE HP DESKWRITER C .. $389

3310

HP SCANJET II SCANNERS



HP SCANJET IIp
Greyscale Flatbed Scanner

300 DPI greyscale scanner
Bonus: Includes FREE Calera WordScan OCR Software

GREAT BUY! $499

60124

HP SCANJET IIcx
The high performance color/greyscale scanner that provides advanced features at a breakthrough price!

- Superior image quality with 1600 DPI enhanced resolution; 400 DPI optical resolution
- 24-Bit color allows you to recognizse and scan over 16 million colors
- HP AccuPage 2.0 for better text recognition
- Optional transparency adapter available
- Optional 50-page document feeder available
- One-year HP Express Exchange Warranty for 24-hour replacement service

$939

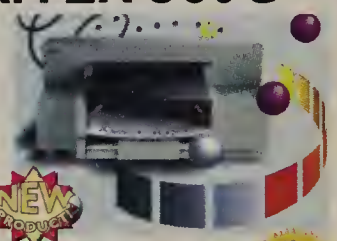
62885

NEW PRODUCT

HP DESKWRITER 560C

HP's affordable high-quality black and color printer for the Macintosh.

THREE YEAR LIMITED WARRANTY!



NEW PRODUCT

- Clear, sharp 600x300 dpi professional quality output HP's exclusive Resolution Enhancement technology
- Easy color printing with ColorSmart technology
- Prints up to 3 pages per minute in black, and an average of 4 minutes per page in color
- Resident black and color ink cartridges for convenient black and color printing without switching cartridges
- 35 TrueType scalable fonts
- AppleTalk and serial interfaces

$579

63821

HP DESKWRITER 310

The new HP DeskWriter 310 printer, no-compromise printing for Apple Macintosh PowerBook® users.



NEW PRODUCT

- Crisp 300 dpi black print
- Optional color kit for amazing color output
- Fast – up to 3 pages per minute
- Compact and lightweight
- 35 scalable fonts built-in
- Background printing
- Optional rechargable battery

$299

62564

HP Fax 900 12 sec./pg.	$779	62567
DeskWriter C - InkJet printer	$389	3310
DeskWriter black ink cartridge (high capacity)	$25	60123
DeskWriter color ink cartridge	$25	3344

*Free shipping and $3.00 offer applies to continental U.S. only; orders over 10 lbs. incur extra charges. Ask phone representative for full details of offer.

CREATIVE COMPUTERS MacMall YOUR MAC SUPERSTORE!™

Offer Code: D452MG14

See ordering policies on last page.

MacMall FAX Order Line: 310-222-5800

International Toll-Free Phone Lines

Australia 0014-800-125-712 • Canada 800-548-2512
Denmark 0434-0297 • France 0590-1099
Italy 1678-74086 • Japan 0031-11-1351
Norway 050-12029 • Netherlands 06-022-8613
Switzerland 046-05-3420 • U.K. 0800-89-1178

CREATIVE COMPUTERS MacMall
YOUR MAC SUPERSTORE™

ORDER TOLL FREE 800-222-2808
Call us for all your Apple Macintosh® Needs!

RAYDREAM

RAYDREAM DESIGNER 3.0
"By far the best modeling & rendering value around...." –MacWorld, August, 1993.

Try the leading 3D illustration package. It handles the details – lighting, shadows, transparency, reflections and perspective are automatic! Actually paint the most complex object in 3D!



62350 **$238**



addDepth
PostScript goes 3D! Attention grabbing 3D depth and perspective for type and line art. Type or draw in addDepth, or import art from other drawing software for automatic 3D.

60951 **$119**

JAG II This award winning graphics utility is packed with new features. Resolution boosting eliminates the jaggies in your images or animations. Supports PICT, TIFF, EPS, PhotoCD, more!



62145 **$85**

Multimedia Theater

90 DAYS same-as-cash FINANCING AVAILABLE!!
(o.a.c. Ask representative for details)

FWB Inc.

SCSI JackHammer NuBus Card	$639	60722
PocketHammer1000FMF Ext. 1GB	$1389	64093
PocketHammer2100FMF Ext. 2.1GB	$3099	64094
HammerDisk1300FMF 1.3GB Optical	$3349	64095
HammerDAT16G Ext. 4-8GB DAT	$1599	64096

Radius - Graphic Cards

PrecisionColor Pro 24X	$1399	61769
BONUS NEC 3Xe CD-ROM from Radius		
PrecisionColor Pro 24XK	$739*	63786
*Price after $50 rebate direct from Radius		
PrecisionColor Pro 24XP	$469	62326
PrecisionColor Pro 24X (7")	$959	61695
Radius rebates/CD bonus valid thru 8/94		

Radius - Multimedia

VideoVision with Premiere	$1825	61327
VideoVision (Basic)	$1599	62146

RasterOps - Multimedia

MoviePak	$518	62520
MoviePak w/Adobe Premiere	$1119	60964
MoviePak 2	$1539	62317
24XLTV	$2519	50287
24STV (7")	$718	63324

RasterOps - Graphic Cards

PaintBoard Turbo XL	$1229	62539
PaintBoard Professional - Starting at	$1799	
PaintBoard 8Li	$319	63553

SuperMac

VideoSpigot Nubus Pro	$1029	60177
Spigot & Sound Pro	$1115	60179
Thunderstorm Deluxe	$855	61370

radius
AUTHORIZED RESELLER

Intellicolor 20"
- 20" Trinitron® color display
- State-of-the-art color temperature control
- On-the-fly resolution and color depth switching



61362 **$1939** NEW LOWER PRICE!

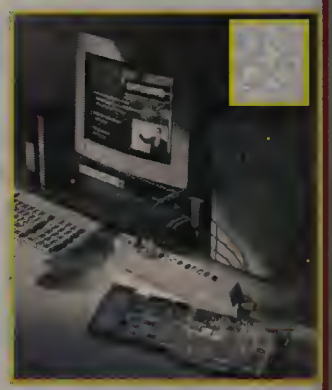


PhotoBooster
Plug-in card to accelerate Adobe® Photoshop specific functions such as filters and plug-ins.

62325 **$729**

VideoVision
Audio/video interface card and external connector panel captures signals from any source and converts them to QuickTime movies. Use any QuickTime editing application.

VIDEO VISION STUDIO



61326 **$3349**

VideoVision Studio Upgrade **$1539** 61785

RASTEROPS®
THE ART & SCIENCE OF COLOR™

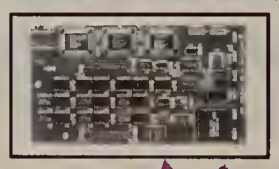


RasterOps/20T 20" Trinitron
This 20" monitor has multiscan/multiple resolution capability bringing you the flexibility you need. NEW LOW PRICE!!!

60848 **$1969**

- Super fine .31mm dot pitch
- Resolutions from 640x480 to 1280x1024
- Trinitron tube • Automatic degaussing
- Microprocessor controlled user-definable settings

MoviePak2 Pro Suite
Complete professional video editing solution. (Includes – MoviePak2, 24XLTV card, Video Expander, Adobe Premier 3.0, ALSoft Disk Express II and MediaGrabber 2.5)



- 60 fields/second full-resolution JPEG video recording and playback • RGB, S-Video and Composite inputs and outputs
- Supports graphics display up to 1152x870 (21")

POWERPC COMPATIBLE

63450 **$3369**

MoviePak Presenter
Low cost, high quality digital video solution for authoring CD-ROMs and other inter-active media. 24-bit color for 14" monitors; 30 fields/second for full-screen video recording. 60 fields/second full-screen playback.



INCLUDES Avid's VIDEOSHOP 2.0 FREE!

62762 **$1379**

FREE CD!





Get up to $200 worth of FREE software included on this disk. Plus interactive previews of over 100 software programs. To purchase any of the programs, simply call the Toll-Free Unlocking Center and you can own the programs instantly.

FREE WITH ANY ORDER!
Request Part #63090

FWB incorporated

SledgeHammer®
Disk Arrays for the Macintosh



SledgeHammer® Arrays match a pair of high performance Fast or Fast & Wide SCSI drives:

- Designed for digital video, multimedia, publishing and prepress
- Sustained transfer rates up to 13.5MB/sec
- Includes RAID ToolKit Software & SCSI JackHammer® with NuBus, Wide, and II models
- Macintosh with PowerPC compatible today

SledgeHammer2000FMF Nubus 4.7MB/Sec **$2829** 64190

SledgeHammer4200FMF Nubus 5.4MB/Sec **$5099** 64091

Performance Storage Peripherals

CREATIVE COMPUTERS MacMall
YOUR MAC SUPERSTORE™

Send mail orders to: MacMall Order Dept.,
2645 Maricopa St., Torrance, CA 90503-5144

MacMall FAX Order Line: 310-222-5800

LOWEST PRICES? YEAH!

LOWEST PRICES ANYWHERE

*If you see a lower price advertised in this magazine, please call us and we'll do our very best to BEAT that advertised price!**

CREATIVE COMPUTERS MacMall
YOUR MAC SUPERSTORE!

ORDER TOLL FREE
800-222-2808

Call us for all your Apple Macintosh® Needs!

POWERBOOK CASES FROM TARGUS
A TRADITION OF EXCELLENCE



For a high quality, low cost case for your PowerBook consider the Targus **NotePac** with a padded computer section 14x11x2.5" and external 13x9x2 accessory pocket. Detachable shoulder strap and interior portfolio section. Model CN01.

61186 Grey
61184 Purple
60696 Black
61185 Teal
61187 Blue

$34.95

Targus Leather Notebook Case



Full grain leather case is designed to carry a PowerBook and related accessories. Padded computer section is 15x11x2.5" plus an external 13x9x2" accessory pocket. Model CLN1.

$94.95 61927



Universal Note Case

Designed to carry PowerBook and personal printer in two separate compartments. 11x13x2.5", plus an expanding section for your work papers. The ideal case for the mobile office! Model CUN1.

$64.95 60090

Enter to win a FREE Apple Macintosh Quadra® 605

4MB RAM
80MB Hard Drive



Keyboard and monitor not included.

No purchase required simply send your complete name, address and daytime phone number to:

MACMALL CONTEST
Dept. AD, 2645 Maricopa St., Torrance, CA 90503-5144.

Entries must be received by May 30th, 1994. Limit one entry per household. Employees and vendors of Creative Computers not eligible.

YOU COULD BE THE WINNER!

Now Software

Now Up to Date 2.0 ...	$63	61020
Now Contact	$63	62753
Now Utilities 4.0.....	$83	60891

Symantec

SAM 3.5	$65	60896
Norton Essentials 1.1	$87	61170
ACT 1.1 with Norton Essentials	$169	63696

US Robotics

Sportster 14.4 FAX & Data Modem	$219	61600

SuperMac - 24-Bit Graphic Cards

Thunder/24 v2.0	$1689	55442
Spectrum Power 1152	$1179	63888
Spectrum/24 Series IV	$789	61066
ThunderStorm.....	$419	60607

SuperMac - Monitors

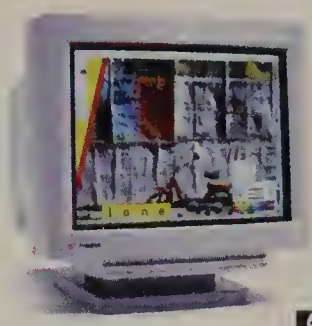
SuperMatch 17T	$1039	60756
SuperMatch Hi-Res 20	$2669	61069

SuperMac - Multimedia

Digital Film	$3239	63881
Video Spigot NuBus	$359	55649
Video Spigot LC	$239	55647

*We will do our best to beat any "delivered" price provided it is a stocking item and our competitor has the item(s) in stock. Ask your phone representative.

SUPERMAC



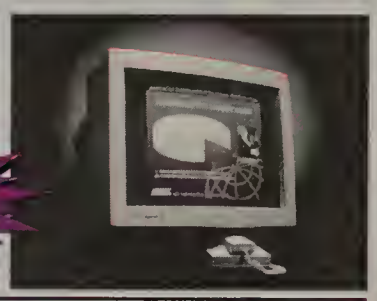
SuperMatch 20TXL 20" Display

- Trinitron Color Display
- 640x480 to 1152x870
- Built-in Tilt and Swivel Base

61371 **$2189**

SuperMatch 17T 17" Trinitron Display

- Multimode Trinitron 17" Color Display
- 640x480 to 1024x768
- Built-in Tilt and Swivel Base



60756 **$1039**

SuperMac Thunder/24 Color Graphics Card

- Single slot high-end acceleration for publishing and design
- Supports 12" to 21" displays (1152x870)
- On-board GWorld display memory
- Hardware pan and zoom
- SuperVideo display software

"...the Fastest we've seen" –MacWeek

55442 **$1689**

RASTEROPS®
THE ART & SCIENCE OF COLOR™

DuoMate 16sc

The most feature-rich mini docking/connectivity station for PowerBook Duo users!

- Up to 21" support, 8-bit
- Ethernet and Token Ring support
- 16-bit color for 14" displays
- Standard SCSI connector support



$519 62142

Bundled with Farallon PowerPath FREE!

RasterOps 20/20 Color Display

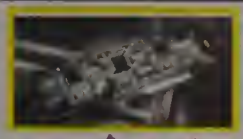


- .31mm super fine dot
- Supports 640x480 to 1158x870 (8 presets)
- Anti-static/glare coating
- Digital user controls
- 3-Year Limited Warranty

$1499 61777

RASTEROPS PRODUCTS HAVE A 3-YEAR WARRANTY!

PaintBoard Lightning



New super fast 24-bit graphic display adapter for NuBus compatible Macintosh models gives you brilliant colors by the millions. Up to 2900% faster than built-in video. Supports up to 1024x768 resolution which makes it ideal for imaging, color publishing and business uses. Works with RasterOps 20/20 monitor and many 17" and 20" displays.

$769 63453

GLOBAL VILLAGE COMMUNICATION



THE NEW POWERPORT SERIES

offers unsurpassed fax/modem reliability and high speed. Communicate at 19,200 bps, and even faster speeds using v.42bis compression. And with FAX speeds of 14,400 bps your communications are faster than ever before. Includes GlobalFax OCR software to convert received faxes into editable files. Also includes: ZTerm, GlobalFax and America Online software FREE!

PowerPort Mercury for PowerBooks	$319	63062
TelePort Mercury for Desktop Macs	$319	63061
PowerPort Gold for PowerBooks with 14.4 bps send and receive data/FAX	$275	60467
TelePort Gold for desktop Macs with 14.4 bps send and receive data/FAX	$275	60661
PowerPort Silver for PowerBooks with 9,600 bps send and receive data/FAX	$245	60466
TelePort Bronzell for Desktop Macs with 2,400 bps data and 9,600 bps FAX	$95	61920

CREATIVE COMPUTERS MacMall YOUR MAC SUPERSTORE!

We do it very fast!

*With our sophisticated order entry, computerized warehouse and Fedex® shipping system we get your order on its way the same day, so you can enjoy your purchase tomorrow!**

CREATIVE COMPUTERS MacMall

YOUR MAC SUPERSTORE!™

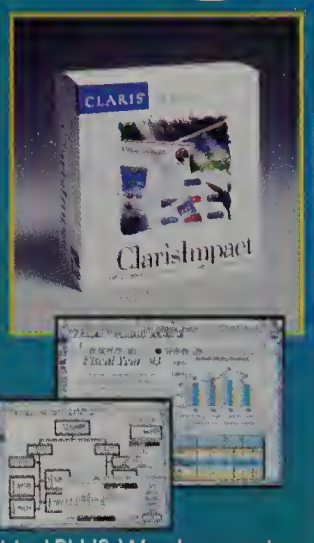
ORDER TOLL FREE 800-222-2808

Call us for all your Apple Macintosh® Needs!

CLARIS

Accelerated for Power Macintosh

ClarisImpact™



The all-in-one business graphics and presentation program that lets you create stunning business graphs, charts and diagrams then incorporate them into text-based reports. Or a slide presentation. All in one program.

ClarisImpact automatically creates and styles org charts, tables and data. Styles can be applied with a single mouse click, without the need for design skills or tedious element editing! PLUS: Word processing and presentation capabilities, instant style editing; 3,000 clip art images, imports EPS, TIFF, PICT, QuickTime movies and many other popular formats. Sophisticated drawing tools include polygon, bezier, fill, color, gradient and more!

NEW! Native PowerMac Version $265 NEW!

MBG **Macintosh Version....$265** 63474

CLEARANCE
ITEMS BELOW COST!

SHARP WIZARD OZ 9600II 512K Organizer	$379	62553
SHARP WIZARD OZ 9500 128K Organizer	$309	62554
MICRONET 45MB REMOVABLE SyQuest w/Cartridge	$299	55926
MASS MICRO 45MB REMOVABLE SyQuest w/Cartridge	$279	55396
MacDepot 235MB Internal Hard Drive	$199	60505
PSI POWER MODEM IV 14.4bps Fax Modem .	$199	61156
PLI Multi-session Double Speed CD-ROM DRIVE	$349	60569
Maxa ALERT Software Checks your system ..	$49	61194

Very limited supply. All items NEW.

ATTAIN

InControl with Dynodex and CPU .	$98	63736

CLARIS

Works 2.0 w/Quicken	$195	62273
FileMaker Pro 2.1	$265	62272
FileMaker Upgrade	$89	63622

MICROSOFT

Works 3.0	$155	60664
FoxPro 2.5	$98	63631
Excel 4.0	$289	60298
Excel Upgrade	$125	60727
Word 5.1	$289	60946
Word Upgrade	$125	60728

RADIUS - MONITORS

Precision Color Pivot	$859	60914
Two Page Display 20/gs	$869	62470

WORD PERFECT

WordPerfect 3.0	$295	62659
WordPerf. Upgrade	$55	63005
Competitive Upgrade .	$89	63003

WACOM

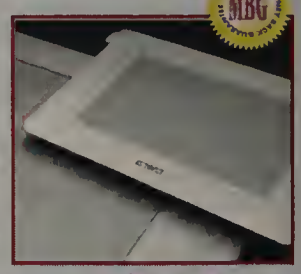


UD-1212R
Drawing Tablet

New 12" x 12" tablet is the perfect fit for any computer artist! New features include a full menu strip, 120 levels of pressure, a transparent overlay surface, a fully customizable cordless bat-teryless pen, and a more powerful interactive interface!

LOWEST PRICE EVER! $499 62484

ArtZ
6x8" Tablet



World's first high-speed ADB compatible graphics tablet. The batteryless, cordless pressure-stylus has 120 levels of sensitivity. Programmable side switch for Undo, macros or other commands. 6x8" work area. Plugs into ADB port.

$289 60962

---

radius™ AUTHORIZED RESELLER

Precision Color 17T



63587

New 17" color monitor with "on-the-fly" reso-lution switching from 640x480 to 1152x870. Digital controls for precise settings and super sharp .25mm dot pitch give you quality you can see! Ask about the Radius worry-free service warranty!

$1239



Radius LeMans GT Display Adapter
plus FREE NEC CD-ROM DRIVE!!

The world's fastest 24-bit display interface for Macintosh, delivering resolutions to 1152x882 with ultra fast 32-bit QuickDraw acceleration. With 3MB of VRAM, and optimzed ASICs, it performs up to 230% faster than built-in video of Quadra!

$2369

BONUS! Direct from Radius NEC 3xe CD-ROM Drive (valid thru 8/93) 63788

Radius 24xp-Pro Display Adapter $469 62326

DAYSTAR DIGITAL

PowerPro 601

Maximum performance upgrade for Quadra 650, 700, 800, 900 and 950, and Centris 650.

Developed in cooperation with Apple, this card gives the graphics professional the maximum PowerPC upgrade. Faster than Apple's upgrade card! Allows up to 128MB memory expansion, PLUS includes over $600 in FREE software including: PhotoMatic and ColorMatch color management.

66MHz .. $1525 64213

80MHz .. $2039 64214

DAYSTAR DIGITAL



Turbocharge your software up to 600% faster. Adapters required.

TURBO 040 ACCELERATORS

Turbo040 – 33 MHz Accelerator w/FPU and cache	61022	$914
Turbo040 – 40 MHz Accel. w/FPU and cache	63421	$1084
Turbo040i – 33 MHz (no FPU)	6230S	$744
FastCache Turbo (128K Cache for Turbo040)	60926	$164

POWERCACHE (for almost all 020/030 Macs)

33MHz PowerCache (w/FPU)	60062	$358
33MHz PowerCache (no FPU)	60061	$274
50MHz PowerCache (w/FPU)	60066	$538
50MHz PowerCache (no FPU)	6006S	$414
Adapter (for Turbo040/040i/PowerCache*)		$98

*Required for non-Mac IIci, IIvi, IIvx, Performa 600

CREATIVE COMPUTERS MacMall YOUR MAC SUPERSTORE!™

Send mail orders to: MacMall Order Dept., 2645 Maricopa St., Torrance, CA 90503-5144

MacMall FAX Order Line: 310-222-5800

Which one do I buy?

Our friendly, helpful MacMall phone representatives will do their best to suggest the right item for your needs!

CREATIVE COMPUTERS
MacMall
YOUR MAC SUPERSTORE!

ORDER TOLL FREE
800-222-2808

Call us for all your Apple Macintosh® Needs!

Farallon®



Only Farallon Gives You Plug-and-Play 10-Base-T Ethernet

EtherWave is the award-winning technology that lets you daisy-chain ethernet using 10Base-T wiring. It is 100% compatible with Apple and other standards, and is much more flexible and cost effective. Use EtherWave cards and transceivers to connect up to 8 devices without a hub, or up to 7 devices per hub port. Every card and transceiver has 2 self-terminating 10Base-T ports, power-off passthrough, a LIFETIME WARRANTY and FREE unlimited technical support.

EtherWave AAUI Apple transceiver ...	$105	62345
EtherWave NuBus Card	$189	62346
EtherWave LC Card	$189	62636
EtherWave AUI Transceiver	$105	63063
EtherWave Adapter for PowerBooks...	$307	62633

LIFETIME WARRANTY!

SONY®

MULTISCAN® TRINITRON® COLOR GRAPHIC DISPLAY MONITORS

GDM-2036S
20" DISPLAY



- Super fine pitch Trinitron tube with 0.30mm aperture grille
- Maximum resolution 1280x1024 non-interlaced
- Full MPRII compliance
- Sony Display Memory includes 9 preset display modes and allows you to define 15 customized modes for precise adjustment of your visual display
- Tilt and swivel stand
- Cylindrical vertically flat black screen reduces ambinet light relfections

$1939 61617



GDM-2038S
20" DISPLAY

A high performance 20-inch Multiscan display perfect for CAD, imaging, graphic design and prepress applications.

- Three color temperature settings
- Trinitron tube with Super Fine dot pitch of 0.30mm
- Sony Display Memory System has 9 presets and allows up to 15 customized modes
- Maximum resolutions of 1600x1280 at 66Hz or 1280x1024 at 80Hz
- Full MPRII compliance

$2049 NEW!

Connections

Farallon® PhoneNET®

BUY TWO GET ONE FREE!



Single: $22.99 50726

3-Pack: $45.98 64156

ASANTÉ



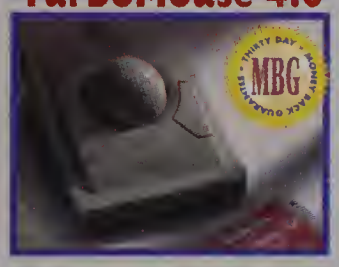
NetExtender Hubs

Asanté's portable 10BaseT NetExtender™ Hubs let you easily create a five node standalone network, or connect four nodes to an existing Ethernet® network. Platform independent. Available in AUI or FN version. 5 year warranty!

$179 64006

KENSINGTON

TurboMouse 4.0



The World's Best Trackball

Two large control buttons with intelligent software to program custom commands and functions.

60396

THE LOWEST PRICE! $99

CREATIVE COMPUTERS
MacMall
YOUR MAC SUPERSTORE!

MACRONIX, INC.

MaxFax™

NEW PRODUCT

14.4 Internal Modem for Apple Macintosh PowerBook

Mobile computing just became faster and easier!



- 100% Apple PowerBook modem compatible
- 14,400 bps Group III send and receive fax
- 14,400 bps (V.42bis) full duplex data transfer
- Low power design uses 50% less battery power than most competing internal modems for PowerBook
- Compatible with: V.42/MNP-2, MNP-3, MNP-4 and v.42bis/MNP-5 data compression
- INCLUDES: ***Fax STFLC***™ fax software with full send and receive fax capability. Fax from any application and automatically append a customized cover sheet. Also includes ***Microphone LT***™ data software with scripting, easy to use graphical interface, and X, Y and Z-modem protocols

64340

FIVE YEAR WARRANTY!

MaxFax 144/M PowerBook Internal ... $189

MaxLite™

14.4 POCKET MODEM

Same great features of MaxFax 144/M in external case for "on the go" computing. Operates on internal 9V battery or from AC adapter! Smallest full-featured fax modem!

MaxLite 144/M Pocket Modem... $199 64341

ASANTÉ





Asante Ethernet Products

Award-winning products and world-class support make Asanté networking products winners all around. Free diagnostic software and technical support with most products. THREE YEAR WARRANTY!

10THUB/12 (10BT hub w/12 10T, Thk & Thin ports)	$464	61705
10THUB/8 (10BT hub with 8 10T, Thin ports)	$228	60707
Mini EN/SC (Tn/10BT SCSI Ether w/DT & PB cable)	$296	61632
Mini EN/SC10T (10T SCSI Ether w/DT & PB cable)	$236	61506
MC+IIE64 (MacII & Performa 600, Thk, Tn, 64K)	$138	60027
MC+IIET64 (MacII & Perfarma 600, Thk, 10BT, 64K)	$138	60029
MC3NB (MacII & Performa 600, Thk, Tn, 10BT, 64K)	$188	60025
AP1001 (AsantéPrint, Thk,/10BT or Thk/Tn)	$328	61721
FN10TA (FriendlyNet Media Adapter 10T)	$59	61244
FNTNA (FriendlyNet Media Adapter Thin)	$59	61242
AsanteLite (NuBus - Thin, 64K)	$128	62155

FREE FEDERAL EXPRESS

On your first order with MacMall!*
$3.00 shipping on future orders!

And No Credit Card Surcharges!

CREATIVE COMPUTERS MacMall YOUR MAC SUPERSTORE!™

ORDER TOLL FREE 800-222-2808

Call us for all your Apple Macintosh® Needs!



SyQuest Cartridges

Lowest pricing on high quality removable cartridges for any compatible SyQuest® drive mechanism.

44MB Syquest Cartridge	$58	1906
88MB Syquest Cartridge	$88	3304
105MB Syquest Cartridge ...	$58	61241

SYQUEST DRIVES



SUBSYSTEMS

High quality removable storage device. Capable of storing up to 270MB of data on a single cartridge.

Syquest 270MB External	$599	64243
Syquest 88C (RIW 44) External..	$439	61944
Syquest 105MB External Drive ..	$399	61945

Quantum

Highest quality internal and external hard drives from MACMALL

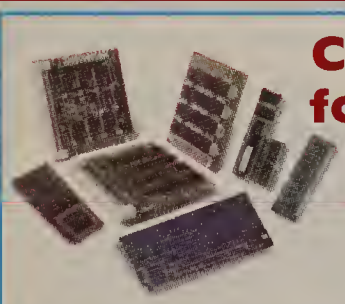




All Hard Drives include "FWB" Hard Drive Software

(Because hard drive prices do fluctuate, please call for our current lowest price!)

GO DRIVE SERIES, 2.5" for PowerBook				
127MB 17ms Internal	$234	63593	External	$314
170MB 17ms Internal	$258	63594	External	$338
256MB 17ms Internal	$338	64039	External	$418
LPS SERIES, 3.5" Low Profile				
270MB 11ms Internal	$258	63196	External	$328
340MB 11ms Internal	$288	5637	External	$358
540MB 10ms Internal	$468	63194	External	$538
1088MB 11ms Internal	$829	5508	External	$899
ELS SERIES, 3.5" Low Profile, Low Power				
170MB 17ms Internal	$184	4356	External	$244
PRO DRIVES				
1225MB 10ms Internal	$969	61331	External	$1039
1800MB 10ms Internal	$1079	5509	External	$1149



Call MacMall for Memory!

For the lowest prices on memory products for your desktop Macintosh or PowerBook, call us FIRST!

1x8 80ns $44	2224	
2x8 80ns $75	60274	
4x8 80ns ... $155	2239	

PowerBook Memory

140-170 2MB $85	60642	
4MB $199	61751	
6MB $269	55471	
160-180 4MB $179	61379	
6MB $279	60774	
8MB $379	60775	
10MB $439	60776	
165c/180c 4MB $199	61383	
6MB $299	61384	
8MB $385	61385	
10MB $479	61386	

CENTRIS, LCIII, QUADRA/POWERMAC

4MB 80ns $149	4468	
8MB 80ns $309	4177	
16MB 70ns .. $678	61271	

QUADRA/POWERMAC 60ns

4MB 60ns ... $169	61203	
8MB 60ns $329	61205	
16MB 60ns non-composite...$749	62615	
32MB 60ns non-composite....$1,449	62425	

Duo Memory

4MB $199	60778	
8MB $359	61034	
12MB $785	60782	
20MB $1,465	60783	



Pricing on memory modules can fluctuate on a daily basis. Please call for the lowest prices.

FEDERAL EXPRESS

*Free shipping and $3.00 offer applies to continental U.S. only; orders over 10 lbs incur extra charges. Ask phone representative for full details of offer.

OCEAN MICROSYSTEMS, INC



VISTA 256

The ULTIMATE Removable Storage

The only 3.5" rewritable optical drive offering 256MB non-compressed capacity, as well as read/write 128MB cartridges. PC-WORLD "Best Buy" 9/93

$989 64338

CREATIVE COMPUTERS MacMall YOUR MAC SUPERSTORE!™

IOMEGA Makers of Bernoulli

BERNOULLI® Drives



These removable drives are unique because they use patented crashless technology!

The Iomega Bernoulli drives offer unlimited growth in capacity, performance rivalling hard drives and a back-up approach better than tape. These, drive packages for the Macintosh environment offer a complete solution for all your storage requirements! 18 msec effective access time, and transfer rates up to 5MB per second, on both models!

LOWEST PRICES EVER!!

MacTransportable 90MB (no cart.) .	$299	64100
MacTransportable 90 Pro (w/one cart.)	$349	60819
MacTransportable 150 Pro (w/one cart.)	$479	61107
90MB Bernoulli Cartridge	$92	63439
150MB Bernoulli Cartridge	$99	63440

BONUS! When you buy a MacTransportable 150 drive, it includes a cartridge full of shareware and software demos!

Send mail orders to: MacMall Order Dept., 2645 Maricopa St., Torrance, CA 90503-5144

MacMall FAX Order Line: 310-222-5800

International Toll-Free Phone Lines

Australia 0014-800-125-712 • Canada 800-548-2512
Denmark 0434-0297 • France 0590-1099
Italy 1678-74086 • Japan 0031-11-1351
Norway 050-12029 • Netherlands 06-022-8613
Switzerland 046-05-3420 • U.K. 0800-89-1178

CREATIVE COMPUTERS
MacMall
YOUR MAC SUPERSTORE!

ORDER TOLL FREE
800-222-2808

Call us for all your Apple Macintosh® Needs!

SHARP

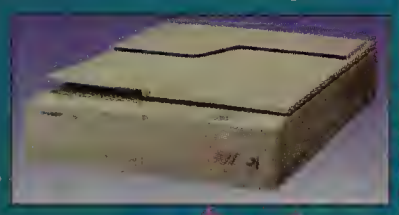
Sharp JX-9460PS
600dpi PostScript Laser Printer



- True 600x600dpi quality printing
- Fast 6 page-per-minute printing with RISC processor
- 250-sheet paper tray
- Standard 2MB RAM, expandable to 9MB (3MB required to auto switch between HP PCL5, Epson FX, IBM Proprinter or PostScript) – works with Macs and PCs
- 35 built-in PostScript fonts
- 27 PCL5 typefaces
- Virtually silent with "sleep mode" and cuts your electric bill!

$999 64244

Sharp JX-325
24-bit 600dpi one-pass color flatbed scanner



- Fast, precise scans with outstanding 300/600 dpi quality
- 24-bit color, 256 shades of grey or black-and-white scanning
- Superior color and clarity with Sharp's one-pass scanning system
- 300dpi optical resolution (600dpi interpolated)
- Maximum scan area is 8.5x11"
- Zooming enhances mapping to a certain size
- Adjustable white balance with edge emphasis allows sharpening
- Widely used SCSI-2 interface

$629 64245

The Home Store

Brøderbund
Mario Teaches Typing $29		62075
Prince of Persia II $31		NEW!
Print Shop Deluxe $49		62391

Electronic Arts
C. Yeagers Air Combat ... $39		62372
PGA Tour Golf $38		55239

Interplay
Bridge Deluxe w/Sharif ... $34		62545

Maxis
SimCity 2000 ..... $41.95		62818

MediaMate
3.5" FlexPack 5 ..... $7		63509
3.5" FlexPack 10 ..... $9		63508
Copy Clip $7		63507
3.5" Disk Travel Color Pk . $9		63506
Multimedia StoreFIle $9		63505
Fastrac Compact $5		63496

Microsoft
Flight Simulator 4.0 .... $42		55421

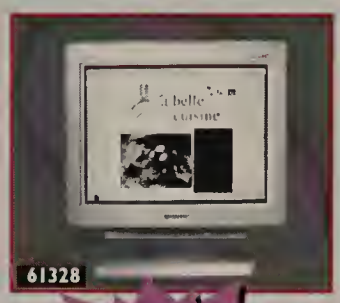
Software Toolworks
Mavis Beacon Typing $29.95		62075
Chessmaster 3000 $29.95		60822

FOUR-YEAR EXTENDED WARRANTY FROM GE SERVICE PROTECTION PLUS AVAILABLE ON ALL HARDWARE PRODUCTS! ASK A MACMALL REPRESENTATIVE FOR FULL DETAILS!

SONY

High Performance, High Resolution Color Displays
With worldwide power certificates, and fully compliant with Swedish MPRII standards.

SONY CPD-1730



17" Color Display

- Trinitron® CRT
- Super fine .25mm dot pitch
- Up to 1024x768
- 72-Hz refresh
- Meets all ELF/VLF emission standards

61328

$1049

ADAPTERS For SONY Displays
Sony to Macintosh... $14 60426
Sony to Quadra $14 60468

SONY GDM-17SE1
17" Multiscan 62940 $1189

- 30% flatter than other Sony monitors
- Up to 1600x1200
- Energy Star compliant.
- Super Fine .25mm pitch.
- Digital controls for advanced image attributes; color temperature.

UMAX
Maximize your image.™

UC1260 1200dpi Color Scanner



This 24-bit, flatbed scanner gives you 600x1200dpi optical resolution and the ability to scan millions of colors.

- Supports materials up to 8.5" x 14"
- 2400dpi resolution through software
- Includes FULL Adobe Photoshop 2.5
- Optional document feeder and transparency option

$1198 61198



UC630LE 600dpi color scanner
- Includes Adobe Photoshop 2.5LE
- Supports material up to 8.5x14"
- Now bundled with Apple's PHOTOFLASH software to simplify the scanning proces
- Rated "Four and a Half Mice" by MacUser magazine!
- Show with optional transparency adapter
- Scan up to 1200dpi through software

62568 $698

60890 **UC840 800dpi** $898
with full copy of Adobe PhotoShop 2.5

60095 **Transparency Adapter** $699
for UC630 LE

Microsoft OFFICE



PLUS: FREE TrueType MasterSet

These best-selling programs in one integrated super package!
- Microsoft Word 5.1
- Microsoft PowerPoint 3.0
- Microsoft Excel 4.0, and
- Microsoft Mail
- Free TrueType Master Set

NOW INCLUDES FREE UPGRADE TO POWER-PC VERSION!!!

$465

MS TrueType valid while supply lasts 60968

CLARIS

ClarisWorks 2.1
Accelerated for Power Macintosh



In addition to its award-winning word processing, spreadsheet, charting, database, graphics, and communication capabilities, ClarisWorks 2.1 now offers dazzling new capabilities. You can have the powerful function of a complete outliner, presentation slid show with QuickTime movies, and color painting. Plus many improved features have been added to all existing applications: text wrap; show/hide invisibles; custom text styles; charts with symbols, color scales and 3D; pop-up database information; 256 colors; advanced drawing tools and much, much more! ClarisWorks 2.0 continues to provide all its powerful capabilities in one seamlessly integrated application – still for less than the price of a dedicated word processor – and still requiring only 1MB of memory to run!

Native PowerPC Version $195 64337

MBG Macintosh Version $195 64216

CREATIVE COMPUTERS MacMall YOUR MAC SUPERSTORE!

Offer Code: D452MG14

See ordering policies on last page.

MacMall FAX Order Line: 310-222-5800

WIDE Selection

MacMall has it all!

If you're looking for a Macintosh peripheral or accessory and don't see it then give us a CALL! We do our best to carry just about everything!

CREATIVE COMPUTERS' MacMall YOUR MAC SUPERSTORE!™

ORDER TOLL FREE 800-222-2808

Call us for all your Apple Macintosh® Needs!

SUPER CD-ROM BUY!!



NEC® Mechanism

Caddyless, all-in-one design

INCREDIBLE PRICE!



FREE "CD•ACCESS"

Includes FREE FWB CD-ROM Bundle

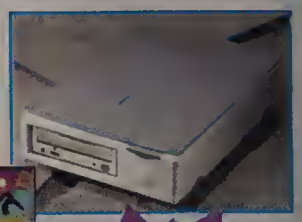


$99

64348

- Single speed drive; NEC mechanism
- Brand New with One Year Warranty

MacMall CD-ROM Drive DOUBLE SPEED



FREE "CD•ACCESS"

Includes FREE FWB CD-ROM Bundle



- Double spin speed
- Photo CD (Multisession) Compatible
- High-speed access: 320 mSec.
- High-speed data transfer rate of 300KB/sec.
- Includes SCSI system cable, external terminator extra

Breakthrough Price!

$289

64089

ANTEC

TRIPLE SPEED CD-4Xpress CD-ROM



- NEC's Triple Speed 195ms, 450kb/sec CD-ROM Drive
- QuickTime compatible; plays audio CDs, too!
- Includes SCSI cable
- Multi-session, PhotoCD compatible
- FREE "CD-Access" CD-ROM

FREE "Compton's Encyclopedia for Macintosh"!!

$579

NEW!



Save up to $500 on CD-ROMS...

Purchase any CD-ROM drive from MacMall and you can purchase any of these great CD-ROM BUNDLES shown below for as little as $79!

Bundles are only available with CD-ROM drive purchase, ordered at the same time.

ENCYCLOPEDIA BUNDLE

INCLUDES THESE GREAT TITLES:



- Groliers Multimedia Encyclopedia CD
- Animals CD
- US Atlas CD
- World Atlas CD

63310

$98

REFERENCE BUNDLE

INCLUDES THESE GREAT TITLES:

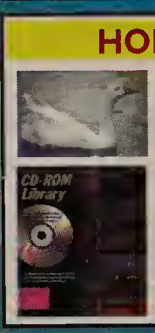


- Guinness Book of World Records CD
- Mayo Clinic CD
- Color It! CD
- Capitol Hill CD

63971

$88

HOME BUNDLE



INCLUDES THESE GREAT CD TITLES

- Family Doctor CD
- Complete Shakespeare
- Audubon Birds CD
- Audubon Mammals

63311

$88

ENTERTAINMENT BUNDLE



INCLUDES THESE GREAT CD TITLES

- Indiana Jones CD
- Secret of Monkey Island CD
- Secret of Monkey Island 2
- Space Shuttle

63713

$78

Best Selling CD-ROM Titles









HELL CAB	$63.95	#61808
THE NEW FAMILY BIBLE	$32.95	#64098
SEVEN DAYS IN AUGUST	$49.95	#63898
SHORT ATTENTION SPAN	$27.95	#63942
MICROSOFT ENCARTA	$88.95	#63947
MYST	$48.95	#62369
SCAVENGER HUNT AFRICA	$29.00	#63994
HEIDI'S GIRLS	$39.00	#64099
JUST GRANDMA AND ME	$38.95	#56018
IRON HELIX	$59.95	#61589

FREE CATALOG SUBSCRIPTION

Offer Code: D452MG14

Fill out this coupon (or make photo-copy) and mail to:

Creative Computers – MacMall, 2645 Maricopa St., Torrance, CA 90503, Attn: Advertising

Name _____

Address _____ Apt. _____

City _____ State ____ Zip _____

FREE CD!

FREE WITH ANY ORDER!

Request Part #63090

Get up to $200 worth of FREE software



included on this disk. Plus interactive previews of over 100 software programs. To purchase any of the programs, simply call the Toll-Free Unlocking Center and you can own the programs instantly.

CREATIVE COMPUTERS MacMall YOUR MAC SUPERSTORE!

MacMall Policies • 30-day or other MBG applies to designated manufacturers only. Call customer service for a Return Authorization, if necessary. All returns without an RMA # will be refused. Returned products must be undamaged in original package with all materials including blank registration card. No refunds on labor or frieght charges. Prices and availability subject to change. While we do our best to check our ads, we cannot be responsible for typographical errors. All trademarks are used without intent to infringe on mark holder. Makes checks or money orders payable to MacMall. "Next Day" shipping only available on orders placed before 5:00 pm EST on in-stock items, without processing problems. Not available to certain rural areas. Free Fedex and $3.00 offers apply to orders under 10lbs delivered to contiguous U.S. only & other terms apply. 90 days same-as-cash financing terms: for purchases charged to a consumer's Technology Card Account. Subject to credit approval by Monogram Credit Card Bank of Georgia. Finance charges and optional insurance charges on your purchases will accrue during the promotional period, but will be credited to account if paid in full within 90 days of purchase date. Except as noted above, finance charges will be assessed at an APR that may vary: 18% in CO, IA, ME NC, and WI; 21.84% in all other states. Minimum finance charges of up to $.50 may be assessed. A complete brochure is available. Extended warranties from GE Service Protection Plus may be purchased for all hardware products for as little as $49.95 and add four years on-site warranty protection to your purchase. Ask your MacMall representative for more info. Product Protection Insurance is available through SAFEWARE, please inquire.
All trademarks and registered trademarks are used to benefit and without intent to infringe on the mark holder. Copr. © 1994 Creative Computers.

MacMall Order Hotline
800-222-2808
Express Customer Service
800-560-6800
Technical Support
(MacMall Customers Only)
800-760-0300

When in Southern California, please visit any of our Creative Computers SUPERSTORES! Southern California's #1 Apple Macintosh® Reseller!



Creative Computers

Los Angeles Santa Monica
1505 Wilshire Blvd.
City of Santa Monica
(310) 394-7779



Los Angeles South Bay
4453 Redondo Bch. Blvd.
City of Lawndale
(310) 542-2292



Orange County Lake Forest
23710 El Toro Rd., Ste. F-1
Lake Forest / El Toro
(714) 859-3300



San Diego Kearny Mesa
8841 Clairemont Mesa Blvd.
Kearny Mesa Area
(619) 467-4700







HARD DRIVES



FUJITSU 1.2GB ONLY $865

Capacity	Description	Internal	External
520MB	3.5" HH 9ms	$4B5	$545
1200MB	3.5" HH 9ms	$B65	$925 SALE
2400MB	5.25" FH 11.5ms	$1385	$14B5

Fujitsu Drives carry a 5 yar warranty

Quantum 1.8GB ONLY $1075

Capacity	Description	Internal	External
GO170MB	2.5" NB 17ms	$245	$375
GO256MB	2.5" NB 17ms	$335	$435
42 MB	3.5" LP 1 7ms	$99	$159
85MB	3.5" LP 17ms	$155	$205
170MB	3.5" LP 17ms	$180	$240
240MB	3.5" LP 10ms	$235	$295
270MB	3.5" LP 10ms	$275	$335
340MB	3.5" LP 10ms	$285	$345
540MB	3.5" LP 10ms	$475	$535
l000MB	3.5" HH 10ms	$855	$915
1200MB	3.5" HH 10ms	$995	$1055
1800MB	3.5" HH 10ms	$1075	$1135 SALE

Go Drives carry a 1 year warranty
The rest carry a 2 year warranty

Seagate 500MB ONLY $469

Capacity	Description	Internal	External
500MB	3.5" HH 10ms	$469	$529 SALE
1200MB	3.5" HH 10.5ms	$865	$925
1900MB	Barracuda 1, 8ms	$1545	$1605
2400MB	Barracuda 2, 8ms	$1825	$18B5
2400MB	3.5" HH 10.5ms	$1595	$1655
3400MB	5.25" FH llms	$2150	$2250

Seagate Drives carry a 1 year warranty.

Maxtor 290MB ONLY $275

Capacity	Description	Internal	External
290MB	3.5" LP 10ms	$275	$335 SALE
345MB	3.5" LP 10ms	$335	$395
540MB	3.5" HH 8.5ms	$699	$759
1200MB	3.5" HH 8.5ms	$1199	$1259

Maxtor 3.5" Drives carry a 1 year warranty.

OPTICAL DRIVES



5.25" Optical Drives PLI 650MB ONLY $1599

Model	Capacity	Seek	MacKit
Sony-650	594/650mb	66ms	$1999
Ricoh-9200 EX/EII	594/650mb	35ms	$1849/1499
MaxOptix-Tahiti II/III	594/650/1gb	25ms	$2599/2999
PLI 650/1.3GB	594/650/1.3GB	35ms	$1599/2999 SALE
PMO-650/1.3	594/650/1.3	19*ms	$2599/2799
HP1.3	594/650/1.3GB	25ms	$2695

Includes external drive, 25/50 SCSI Cable, Mac SW, and Terninator

Cartridges	
D5C 594/650MB	$85
3M 594/650MB	$99
Sony 594/650MB	$119
Sony 1.3GB	$139

650MB ONLY $85

3.5" Optical Drives Panasonic 128MB ONLY $689

Model	Capacity	Seek	MacKit
Panasonic	128mb	35ms	$689 SALE
Fugitsu-128	128mb	30ms	$869
SonyP-301	128mb	35ms	$1049
Most-256	128/256mb	37ms	$1199

Includes external drive, 25/50 SCSI Cable, Mac SW, and Terninator

Cartridges	
D5C 12BMB	$29
Komag 12BMB	$33
Sony 128MB	$45

128MB ONLY $29

No One Has A More Complete Family of 5.25" & 3.5" Rewritable Optical Drives than SuperMicro

0% DOWN SUPER LEASING



Call our new leasing department for all your leasing needs. You will enjoy the freedom to lease the equipment you want to meet your individual needs. We can lease you a complete system or a hi-res printer you can choose a 1, 2, 3, 4 or 5 year 100% tax deductible lease.

PRE-PRES5 SUPER 5YSTEM

- Quadra 840AV 40MHZ/CD-ROM
- 24MB RAM
- S00MB Hard Drive
- Extended Keyboard
- SuperMac 20" Hi-Res Color Monitor, 24bit
- Accel-a-Writer 8100, 960 dpi, 11x17 Laser Printer
- Scan AV 6400 dpi PhotoShop, LE

Special Note: You can add equipment to or take equipment away from the above system. Just call our leasing department for a lease estimate.

Three **Super** reasons to lease from **SuperMicro:**

1. 24 hour approvals
2. 100% tas deductible
3. Over 20,000 products available for Lease

24 hour approvals, CALL NOW!

SCANNERS



Model	Description	Price
MICROTEK		
ScanMaker II/UC630	24-bit Color, 600x300 dpi	$659/659
ScanMaker IIxe/UC840	24-bit Color, 600x300 dpi	$9B9/925
Transparency	For Microtek & UMAX	$599/699

SCAN AV

Scan AV 4800x4800 dpi 24-bit color only $589

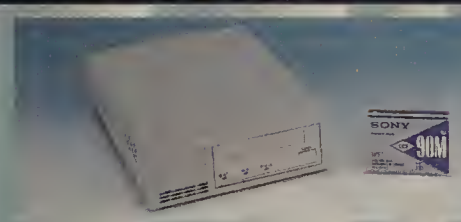
Scan AV 6400x6400 dpi 24-bit color only $699

SYSTEMS



Model	Description	Price
Q950 B/270	17" Monitor, X Keyboard	$4129
Q950 8/270	14" Monitor, X Keyboard	$3929
Q840AV B/270	17" Monitor, X Keyboard	$3819
Q840AV B/270-CD	14" Monitor, X Keyboard	$3919 SALE
Q650 8/270	17" Monitor, X Keyboard	$2789
Q650 8/270-CD	14" Monitor, X Keyboard	$2889
Q660AV 8/270	17" Monitor, X Keyboard	$2539
Q660AV 8/270-CD	14" Monitor, X Keyboard	$2639
Q800 8/270	17" Monitor, X Keyboard	$3139
Q800 8/270-CD	14" Monitor, X Keyboard	$3239

TAPE DRIVES



Model	Capacity	Size	MacKit
Archive Viper 250	250MB	3.5"HH	$499
Archive Viper 525	500MB	3.5"HH	$699
5ony 5DT-2000	2Gbyte	3.5"HH	$899
5ony 5DT-4000	4Gbyte	3.5"HH	$995
5ony 5DT-5000	5-16 Gbyte	3.5"HH	$1299 SALE
Exabyte 8200	2Gbyte	5.25"FH	$1299
Exabyte 8500	5Gbyte	5.25"FH	$2199
Exabyte 8205	2-5Gbyte	5.25"HH	$1595
Exabyte 8505	5-10Gbyte	5.25"HH	$2275

Includes external drive, 2S/S0 SCSI Cable, MAC SW II, and Terminator. Retrospect add $7S

Tape			
5ony DAT	$22	Maxell 8mm	$19

SYQUEST DRIVES



Model	Internal	External
5yquest 270	$499	$599
5yquest 105	$279	$339
5yquest 88C	$275	$335 SALE
5yquest 44	$199	$239

Includes external drive, 2S/S0 SCSI Cable, Mac SW, and Terminator

Cartridges	8BMB cartridges only $72.99
270MB Cartridges *(5+ or with drive purchase)*	$98.99
105MB Cartridges *(5+ or with drive purchase)*	$59.99
88MB Cartridges *(5+ or with drive purchase)*	$72.99
44MB Cartridges (5+ or with drive purchase)	*$49.99*

MULTIFUNCTIONAL



Multifunctional	MacKit
5yquest 88C & 650 Optical Drive	$2389
5yquest 88C & Photo CD-ROM & 520MB Hard Drive	$1389

*A **SuperMicro** multifunctional drive is a custom-made combination of hard drive, optical drive, CD-ROM drive, tape drive or Syquest drive all mounted together in the same enclosure. You decide which components you need, and SuperMicro will build for you.*

There are many advantages to multifunctional drives over individual components:

- *Single unit requires less space*
- *Guaranteed compatibility*
- *Costs less than separate components*
- *No tangle of power cords*
- *Easy to move to a different computer*

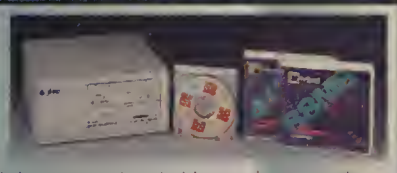
BUNDLE SPECIAL

Purchase $400 or more and get Adobe Photoshop 2.5 full version for $250



PRESENTATION COMBO

Syquest & Duel Speed Photo, CD-ROM drive **$775**



A syquest cartridge is large enough to hold several presentations. Use the CD-ROM drive as a source of graphic images. With this combo, you can bring everything you need on disk, and quickly connect it to your client's computer for the presentaton.

385 Van Ness Ave., Torrance, CA 90501 • 1-310-782-5760 International • 1-310-782-5974 Fax

800-352-3415

MasterCard VISA UPS Federal Express



SuperMicro

We Specialize in Image Processing

Circle 126 on reader service card

UMAX FUJITSU TOSHIBA RICOH CONNER Maxtor MICROTEK dsc Quantum

We're not like the other

We go the extra

Macintosh™ Systems



Whether you need a system for high-end color publishing, professional pre-press applications, desktop design and production or simply business productivity – Express Direct can custom configure a Mac System that's right for your specific job and right for your budget.

And remember, all Macs aren't created equal! At Express Direct we do more than take orders and ship boxes. We install the memory, video card and system software. Then we test every System – so all you need to do is plug it in! And only Express Direct gives you Toll-Free Technical Support with every Mac!

New Low Prices

Apple Quadra 840 AV with CD-Rom Drive 8MB RAM, 230 MB HD, includes Ethernet & FPU. • Add 16" Trinitron display with accelerated 24 bit color card, Extended Keyboard & System 7.1. Call for Complete System prices

Power Macintosh™

PowerPC™ Talk to an expert.

$3799



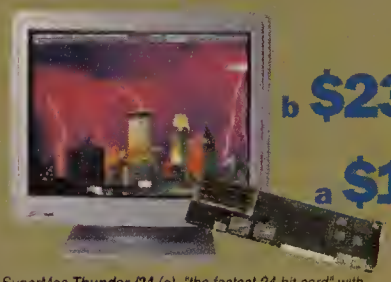
newgen

The new high-resolution, edge-to-edge Newgen ***Imager 6L*** *produces 600 dpi, 11x17 production-quality output. Also available is the 800 dpi, letter size* ***Newgen 880p****. $1849*

Newgen's superior engineered products bring high-resolution, "service-bureau-like printing" to the personal printer. Newgen's proprietary Image Enhancement Technology produces incredibly crisp output normally found in printers at twice the price. And patented Auto Recognition Technology allows all Newgen printers to be attached to multi-platform networks for maximum flexibility and compatibility.

b $2349

a $1699



SuperMac ***Thunder /24*** *(a), "the fastest 24-bit card" with free DSP & the award winning* ***20•TXL****. 20" Trinitron display (b)*

SUPERMAC™

For color publishing & pre-press, nobody delivers more power and performance than SuperMac. SuperMac's 24-bit graphic accelerators constantly sweep MacWorld magazine's top 3 ratings for the fastest cards on the market. SuperMac's large screen displays are tailored to the demands of the graphics professional.

$2979



Get true RAID performance on any NuBus Mac with the potent combination of FWB's 2.0 GB ***SledgeHammer 2000 FMF NuBus*** *and FWB's* ***SCSI JackHammer*** *accelerator card.*

FWB incorporated

FWB produces the industry's broadest range of affordable, high-performance disk array storage subsystems. Choose the solution that's best for you from the SledgeHammer family of disk arrays, which now includes the top performing SledgeHammer II and SledgeHammer Wide. No matter which Macintosh you have, you'll benefit from the unsurpassed professional performance of an FWB disk array. Power Macintosh compatible.

We stock a complete line of quality products from all of the above manufacturers & more.

1-800-765-0020

Express Hours (CST) M-F 8am-7pm, Sat 10am-2pm • 24hr Fax • Customer Service Hotline: **1-800-236-3059**

Get it Direct!

Apple, the Apple logo, Macintosh, Macintosh Quadra and Power Macintosh are trademarks of Apple Computer, Inc. Prices are subject to change without notice. A 2% surcharge applies to American Express purchases. All returned orders may be to a 15% restocking fee plus return shipping. Call for RMA before returning. Software, unless defective, cannot be returned after it has been opened. All warranties on Macintosh or Apple brand products sold by Express Direct will be honored by Express Direct or its authorized agents only. All other manufacturers' warranties still apply. Extended Service Plans are optional and available for an additional cost. Call for complete details.

mail order companies.

mile for you.



We'll give it to you straight.

When it comes to product knowledge and understanding the needs of graphic professionals – **nobody even comes close to Express Direct**. Not the other mail-order companies, not the superstores, not even your local dealer.

When you call us - **you'll talk with an expert**. Someone who's done their homework, knows the product, knows what they're talking about. Not an order-taker, like you get with the other mail-order companies.

We carry only top-notch products from the industry's best manufacturers. No garbage. You demand quality and so do we. What's more, our strict criteria for selecting products means we always get the lowest price – directly from the manufacturer. So **nobody can give you a better value** than Express Direct.

But that's just the beginning. With customer service and technical support that's the best in the industry, we make it our business to take care of you. All this is just a free phone call away. So, call Express Direct today. **You're going to love working with us!**



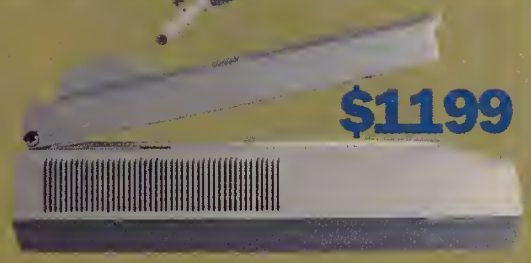
a **$1049**

b **Call**

*Performance and Value: FOCUS Enhancements razor-sharp **Lapis 17t** (a) & the most affordable accelerated 24-bit color interface (b).*

FOCUS enhancements

FOCUS Enhancements' Lapis T17 is without a doubt the best value available today. Offering an unmatched combination of performance and price, this 17" Trinitron gives you sharp, brilliant color in 4 resolutions. Add the accelerated 24-bit color card, and you've got all the features and speed at half the price of all the comperable systems. Now you can have the performance you demand at a price you can afford.



$1199

*The Umax **UC1260** offers incredibly accurate 1200 dpi scanning in 1 to 24-bits of color. Shown with optional transparency adapter.*

UMAX

From affordable 24-bit color at under $900, to top-of-the-line, 1200 dpi performance, Umax offers a scanner for every need and budget. With Adobe Photoshop for image editing and manipulation and an optional transparency adapter for scanning slides and transparencies, Umax scanners bring professional power to the desktop!

800

• Unlimited toll-free technical support

FULL WARRANTY COVERAGE

• Full warranty coverage

AUTHORIZED

• Authorized service & sales

• Flexible payment & leasing terms for those who qualify

International Orders Shipped Daily

Fax: 312.549.6447 Ph.: 312.549.0030

1801 W. Larchmont Ave., Chicago, IL 60613 USA

EXPRESS DIRECT

"The Color Experts"



Magic 1GB RAID $1,899

Transfer Rates up to 10 Megs a Second

Magic 2GB Tape $699

The Magic RAID System is a Nubus SCSI 2 card based array system. RAID levels 0 and 1 and/or levels 0,1,4, and 5 with access times down to 4ms and transfer rates up to 10 MB/Sec at RAID level 0 can be configured from software. The system is compatible with SCSI 1 and 2, SCSI Manager 4.3. RAID drives are all metal construction complete with all cables and software.

Magic 1.0 GB RAID.....$1,899
Magic 2.0 GB RAID.....$2,699

5X faster than the APS Pro DAT

The Magic 2Gb compression tape drive will backup your data at amazing speeds over 68MB / Minute. It is the only tape drive fast enough to keep up with a RAID drive. You can do a full 1GB backup in only 15 minutes. Retrospect 2.0 included.

RailGun Dual Screen Accelerators *For Plus, SE, and Classic.*

	RailGun	Pro
68030 RailGun 16MHz	$279	$299
68030 RailGun 25MHz	$299	$399
68030 RailGun 33MHz	$399	$499
19" Two Page Monitor		$299

*All prices quoted for SE version. Call for pricing on Classic or Plus version

Magic Memory

Memory upgrades available for all PowerBooks. Call for best pricing.

PowerBook RAM.....Call
Newton 1MB / 2 MB.....From $159
1MB / 2MB SIMMs.....From $25
4MB / 8MB SIMMs.....From $144

All Magic memory has a 30 day money back guarantee and a lifetime warranty

16MB / 32MB SIMMs.....Call
LC/Quadra VRAM.....$29/19
ColorBlaster LC™.....$149
Blazing high end color graphics for LC & Performa. Faster, larger QuickTime movies.

Magic Network

Magic Net Adapter.....$14
Manufactured under license from Farallon.
Magic 10BaseT Adapter.....$49
Magic ThinNet Adapter.....$49 New
Magic 8 Port 10BaseT Hub.....$149

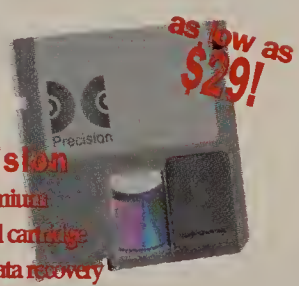
Magic Modems

All FaxModems come with full feature Fax STF™, Microphone®, America Online, and Compuserve Startup Kit.



Magic Hard Drives





° Precision
- A premium optical cartridge
- Free data recovery
- Lifetime warranty

Magic 240 Ext. for $299

Custom configurations available. Call for current pricing and warranty information.

Manufacturer	Sizes Available in Megs.			
Maxtor	345	540	1200	1240
Micropolis	1200	1700	2400	3000
Quantum ELS	127	170		
Quantum Go	85	127	170	256
Quantum LPS	240	270	340	525
Quantum PRO	700	1225	1800	
Empire	540	1080		
Seagate	1200	2500	3400	9.0
Barracuda	1900	2500		
SyQuest	44	88	105	270
Fujitsu	240	520	1200	2400

Magic Optical

2 Year Warranty

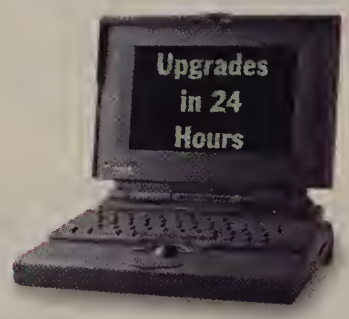
Magic 256MB Optical**.....$899
Magic 128 / 256MB Cart.....$34/$65
Precision 128 Carts / 10 Pack°.....$290
CDR 63/74 Min.....$20/24

Magic SyQuest

Magic 45R SyQuest**.....$299
Magic 88C SyQuest**.....$489
Magic SyQuest*105/200/270.....CALL
Iomega 150 Transportable*.....$579
SyQuest 45/88/105 Cartridge.....$59/89/64
150 Transportable Cartridge.....$99

* One Year Warranty
** Two Year Warranty
*** Three Year Warranty
†† Five Year Warranty

PowerBook Accelerators



MacProducts USA can transform your Powerbook 140 or 145 into a 170, your 160 into a 180, or your DUO 210 into 230.

140 Upgraded to 170
25mhz (68030/68882).....$329
33mhz (68030/68882).....$399
145 Upgraded to 170
25mhz (68882).....$129
160 Upgraded to 180
33mhz (68030/68882).....$399
210 Upgraded to 230
33mhz (68030).....$299
24 hour turn around backed with 1 year warranty.

Magic FaxModems

New

Magic V.Fast Class.....$249.00
28,800bps modem. 14400bps send & receive fax, V.42bis/V.32bis hardware & MNP-1-10 protocols. 2 year warranty, 30 day money back guarantee.

Magic14,400 Data Fax Modem.....$139.00
57,600 bps data. 14400bps S/R fax, V.42bis/V.32bis, MNP-1-5 protocols. Beats the Supra Lc Hands Down in Performance

With VoiceMail.....$189
High Speed Modem Cable.....$15
Hardware Handshaking.

Magic PowerBook Modems

14400 bps Data/FaxModem.....$199
57,600 Data 14400 Fax, V.32bis, V.42bis, MNP 1-5.
24/96 Data/FaxModem.....$79
2400bps modem. 9600bps send & 4800bps receive fax. V.42, MNP 1-5.



MacProducts USA

800 622 8721

THIRD WAVE

International Sales 512-476-5295 Fax 512-499-0888

Magic. Hard Working Tools For Your Macintosh Since 1985.

Corporate & Educational purchase orders accepted. MasterCard, Visa, Discover, American Express & COD accepted. Prices subject to change & availability. Texas residents add 8% sales tax. MacProducts cannot be responsible for errors in typography or photography. MacProducts offers a 30-Day Money Back Guarantee on all Magic™ Products, excluding original Shipping. Call for RMA before returning merchandise. Returns subject to a restocking fee. All brands & product names are trademarks of their respective holders.

M64MW

Circle 175 on reader service card

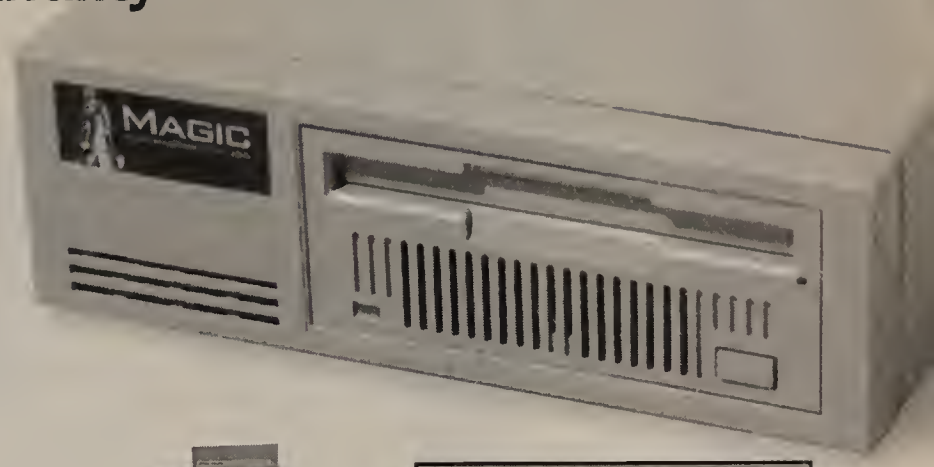
Still Faster Than Fujitsu for $719

Magic 128 Optical With a 2 Year Warranty

- **Faster than the Fujitsu 128**
- **Twice the warranty 2 years**
- **Better Software than APS or FWB**
- **Authorized Repair Center**

The 128 mechanism used in the Magic 128 Magneto-Optical was rated in MacWorld December 93 as being 15% faster overall than the Fujitsu 128. The Magic 128 Optical has a max transfer rate of 3.3 MB/Sec using a split head laser design.

Magic 128 Optical ** $719
Magic 256 Optical ** $899



Magic CD-ROM

Absolute CD-ROM Compatibility and Blazing Speed. The AllCache™ driver software replaces your CD-ROM drive's original driver software, allowing drive access functions to be sped up significantly.

Magic CD Pro 4101 Toshiba.....$349
Magic CD Pro 3401 Toshiba.....$499
Magic CD Pro 6 Quadraspin™.....$1399

CDs

CD-ROM Multimedia Encyclopedia.....$49
W/purchase of CD Drive
6 CD Bundle.....$49
Call for CD-ROM Catalogue ◆



JetInc. Ink Jet Refills TwinPacks for Deskwriter

Two Pack Black $15.99
BUY 3 GET 1 COLOR FREE
High Capacity Black $19.99
Apple Color printer BJ800, 550C, 560C 310 BJ300 CALL



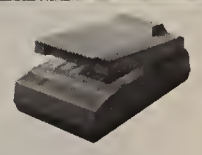
Free NEC 3Xe with purchase of Lemanse GT or 24x Pro



Diimo 50Mhz
$413.00
Diimo 50Mhz
With FPU
$518.00



TI Microlaser Pro
PRO 600 PS23 / 65
$1299/1465 After
$60rebate
TI MicroWriter
$679.00



Umax 630 LE
$700.00
Umax 1260
$1149.00



Wacom ArtZ and 12 x 12
6x9 $279
UD1212RM $509



Apple PowerBook 180c 4/160
$Call



Cartridges
44MB $55.00
88MB $85.00
105MB $64.00



Quark Express 3.2
$539.00

SYSTEMS	
Custom Configurations Available	
PowerMacs from	$1749.00
PowerMac Upgrades	Call
Quadra 840av	$2,650.00
Quadra 660av	$1,529.00
Quadra 650	$1,899.00
Quadra 610	$1,349.00
Quadra 605	$849.00
Duos/PowerBooks/Newtons	Call

COMMUNICATIONS	
Asante 10T Hub/12	$459.00
Asante 10T Friendlynet	$59.00
Asante 10T Hub/8	$219.00
Starnet Ethernet Card	$97.00
8 Port 10BaseT Hub	$149.00
Dayna Etherprint Plus	$399.00
Dayna Pathfinder	$575.00
Farallon Etherwave	$99.00
Farallon Timbuktu 5.0	$119.00

INPUT	
Abacus Keypad	$89.00
Apple Extended Keyboard	$158.00
Mac Pro Keyboard	$115.00
DGR Extended Keyboard	$79.00
Kensington Turbo Mouse	$99.00
Wacom ArtZ	$279.00
Wacom UD1212R	$509.00

MODEMS & FAXES	
Supra 14.4 Mac Package	$215.00
Global Village Teleport Gold	$277.00
Global Village Mercury	$319.00
Supra 14.4 LC Package	$159.00
Supra 14.4 PB Package	$219.00

PRINTERS	
Stylewriter II	$349.00
Apple Laser Pro 360	$1,525.00
Apple Laser Pro 810	$4,599.00
TI Pro 600 PS23After Rebate	$1,299.00
HP Deskwriter's	Call
HP 4MP	$1,475.00
DEC Laser 1152	$649.00
Kodak Color Ease PS	6,499.00
Kodak 450 GL	1,545.00

VIDEO SOLUTIONS	
Supermatch 20TXL	$2,149.00
PressView 21	Call
Supermac 17T Trinitron	$1,045.00
Thunder II	$2,299.00
Thunder II GX	$2,699.00
Digital Film	$2,849.00
E-Machines T-16II	$1,149.00
E-Machines T-20	$2,199.00
Futura II SX	$425.00
Ultra LX	$1,119.00
Radius 20i Intellicolor	$1849.00
Radius TPD 20GS Display	$799.00
Precision Color Pro 24x	$1,245.00
Precision Color Pro 24xp	$439.00
PhotoBooster	$769.00
VideoVision Studio	$3,299.00
Rasterops 20 Trinitron	$2,199.00
Rasterops 2020c	$1,499.00
Moviepack w/Premier 3.0	$1,149.00
Precision Color Display 17"	$1,124.00
Paintboard Turbo/Pro	$1095/1299.00
Apple 14	$319.00
Apple Audiovision Monitor	$599.00
Lemanse GT	$1899.00
Sony 14/1730	$589/1049.00
Nec 3/4/5/6	Call

ACCELERATORS	
Daystar 040 33Mhz IIci	$739.00
FastCache Turbo	$165.00
Daystar 50 PowerCache	$430.00
Daystar PowerMac	Call
StageTwo Rocket 40	$1449.00
Radius Rocketshare	$299.00

DRIVES	
Magic/TW DAT 2GB	$999.00
Magic/TW DAT 8GB	$1,199.00
NEW! TW DAT 16GB	$1,399.00
Fujitsu 1.2GB	$949.00
Quantum 540MB	$499.00
Quantum 1.2GB	$999.00
PLI 40R/88 Syquest	$329/469.00
PLI105 /270 Syquest	$429/629.00
PLIDAT 4GB	$1,399.00

SCANNERS	
Microtek IIXE	$1,080.00
Microtek IISP	$759.00
Microtek 35T	$1349.00
Umax 630LE	$675.00
HP ScanJet IICX	$929.00
Tamarak 1200	$1,564.00
Nikon CoolScan	$1,920.00

SOFTWARE	
Adobe Illustrator 5.0	$369.00
Adobe Photoshop 2.5.1	$499.00
Aldus Pagemaker 5.0	$499.00
Canvas 3.5	$269.00
Filemaker Pro 2.1	$235.00
Fractal Painter	$249.00
Fractal x2	$79.00
Freehand 4.0	$369.00
Macromind Director 4.0	Call
MiniCad+ 4.0	$499.00
MS Excel 4.0	$279.00
MS Word 5.1	$279.00
Quickeys 3.0	$103.00
Suitcase 2.1	$49.00
System 7.1 Pro	$99.00

MacProducts USA THIRD WAVE 800 622 8721

608 West 22nd Street Austin, Texas 78705 USA Tel 512 476 5295 Customer Service 512 472 8881 ext 403 Fax 512 499 0889 Canada 512 622 8721

M64MW

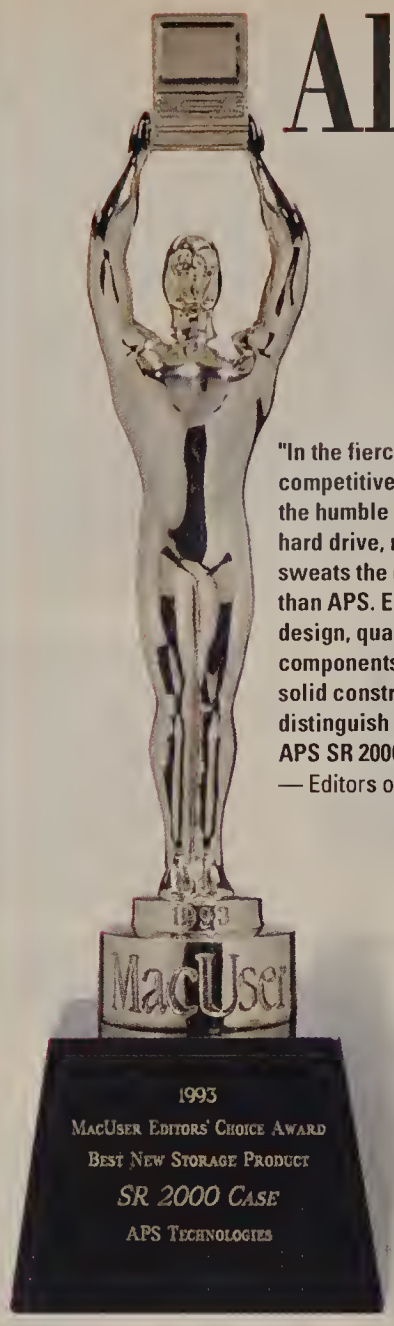
Circle 186 on reader service card

OPEN 7 Days a Week

Priceless Support!

Great Products.

All Drives Are Not Equal.



"In the fiercely competitive world of the humble desktop hard drive, nobody sweats the details more than APS. Elegant design, quality components, and rock-solid construction distinguish the compact APS SR 2000 Case."
— Editors of MacUser



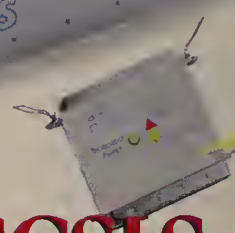
STOP SCSI VOODOO

DATerm, APS' own patent-pending digital active termination technology helps you end SCSI Voodoo by eliminating SCSI line pulse fluctuations, as well as confusing signal and voltage reflections. Its unique impedance-matching characteristics provide superior signal-to-noise ratios, decreases SCSI retries, allows more reliable data transmission and improves SCSI chain stability. DATerm is available in the award-winning APS SR 2000 enclosure, as well as our new portable Companion II enclosure and SCSI Sentry.™

SR 2000 StacKIT™ $24

- End Cable Bondage Forever!
- Minimize SCSI Chain Length
- Heavy Metal Shielding Protects SCSI Signal
- StacKIT Includes Four Concave Stacking Feet
- StacKIT Includes Exclusive APS SCSI C "Connector"





Just $99

SCSI Sentry™

Now you can "stop SCSI Voodoo" on your SCSI Chain, even when you're not ready to buy a new drive. Our new SCSI Sentry™ gives you all the benefits of APS' acclaimed DATerm technology in the form of an external SCSI performance monitoring instrument.

Benefits	SCSI Sentry
Optimizes Overall SCSI Performance	✓
Exclusive Digital Active Termination	✓
Provides Ideal Termination Power	✓
Drastically Reduces SCSI Retries	✓
Regulates SCSI Line Voltage	✓
Solves Bus Impedance Issues	✓
LED Activity Indicators Diagnostic Tool	✓
Easy Installation: Takes Seconds	✓

APS HARD DRIVES

Model	Capacity	Internal	SR2000
163MB - 1029MB			
APS Q 170[2] Quantum 170 LPS mechanism	163MB	229	319
APS MX 240[2] Maxtor 7245 mechanism	234MB	259	349
APS Q 270[2] Quantum LPS270 mechanism	257MB	359	449
APS MX 290[2] Maxtor 7290 mechanism	276MB	329	419
APS MX 345[2] Maxtor 7345 mechanism	324MB	339	429
APS 340[2] 340 mechanism	327MB	429	519
APS Q 540[2] Quantum 540 mechanism	516MB	529	619
APS MS1.2AV[5] Micropolis 2210AV mechanism	965MB	999	1089
APS MS1.2[5] Micropolis 2210 mechanism	1001MB	899	989
APS MS4110[5] Micropolis 2210 mechanism	1002MB	999	1089
APS Q 1080[5] Quantum 1080S mechanism	1029MB	859	949

Model	Capacity	Internal	SR2000
1611MB - 2845MB			
APS ST 1.6[5] Seagate ST11950 Barracuda mech.	1611MB	$1499	$1589
APS MS 1.7AV[5] Micropolis 2217AV mechanism	1612MB	1399	1489
APS MS 1.7[5] Micropolis 2217S mechanism	1682MB	1299	1389
APS ST 2.0[5] Seagate ST 125500N Barracuda mech.	2040MB	1869	1959
APS MS 2.4G[5] Micropolis 1926 mechanism	2100MB	1599	✦1699
APS MS 3.0G[5] Micropolis 1936 mechanism	2845MB	2249	✦2349

• *Internal drives for Quadra 800 and Centris 610 available.*
* *Internal Price Listing*

1-5 *Denotes length of manufacturer's warranty*
✦ *External Case is Special Full Height Only*

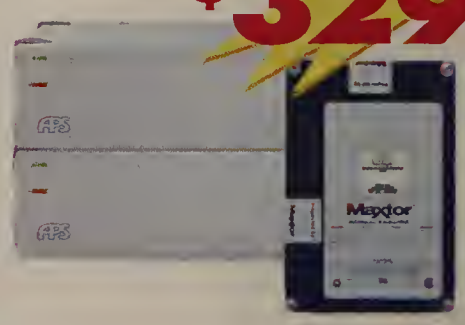
POWERBOOK DRIVES

Model	Capacity	LW Pro 630	Internal	Companion II AC/DC
APS PB 85[1]	80MB	$249	—	—
APS PB 170[1]	160MB	349	$299	$439
APS T 213[1]	202MB	409	359	499
APS PB 250[1]	240MB	449	399	539
APS T 340[1]	324MB	579	529	649
APS T 520[1]	500MB	949	899	1039

APS MX 290

The APS MX 290 provides great performance with transfer rates of 1.8MB per second, access speeds of 24 ms and seek times as low 13.1 ms. This 276MB drive is a terrific upgrade for any Mac.

$329*



PORTABLE STORAGE

The Perfect Home for your 2.5" PowerBook Drive.

Companion II Enclosures	AC	AC/DC
Enclosure	$89	$139



The Best Portable Enclosure Available!

YES!! $139

4 Hour Battery!

APS Technologies

(800) 874-1428

MACWORLD MW SERVICE HERO

Hey, That's My DAT!

All APS Drives Are Power PC Mac Compatible! YES!

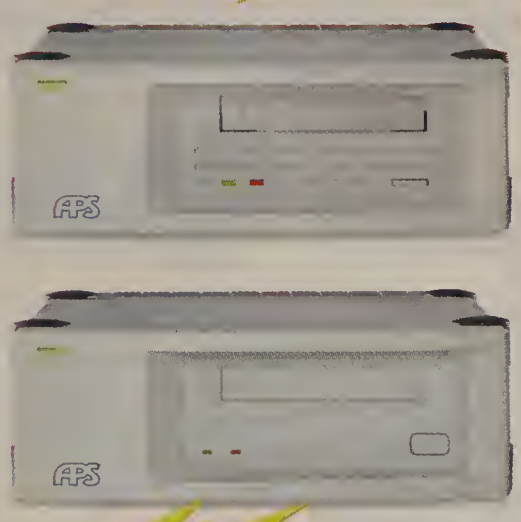
Only APS DATs bring you all the benefits of our SR 2000 enclosure with DATerm, Digital Active Termination

APS DAT

The amazing APS DAT offers you great performance and reliability. Get up to 2.0GB on a 90 meter tape with backup speeds as high as 10MB per minute.

All DATs include Retrospect, a $139 Value, Free!

APS DAT **$799**



APS HyperDAT Speed

If you need high-speed backup (not the kind that ties your server up and slows down your network), you need the DDS-2 power of the APS HyperDAT! Back up locally at rates as high as 28MB per minute! Pack up to 10GB on a single tape! Best of all, your regular DDS and DDS compression tapes can be read in the APS HyperDAT, too!

APS HyperDAT™ **$1499**

1993/94 Macworld Magazine World Class Award - APS Hard Drive Series Readers' Choice



THE APS ADVANTAGE

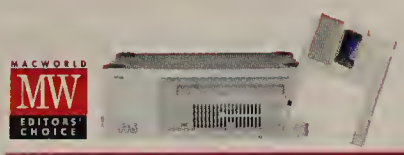
- 30-Day MBG
- Toll-Free Support
- Awesome Warranti
- Factory Direct Quality
- Rapid Repair Return
- 24-Hour Product InfoFax

DAT

Model	Capacity*	Internal	SR 2000
APS DAT[2]	1.8-2G on 90m tape	$749	$799
APS Turbo DAT[2]	4-5G on 90m tape	1149	1199
APS HyperDAT[1]	8-10G on 120m tape	1449	1499

**Actual data compression and tape capacity vary greatly depending on the type of data recorded, other system parameters and environment.*

60 meter DAT Tape – $12, 10 Pack – $110
90 meter DAT Tape – $16, 10 Pack– $130
120 meter DAT Tape – $35, 10 Pack– $300
All APS DAT Drives Include Retrospect by Dantz & 1 FREE DAT Tape



CD ROM

Model	SR 2000
APS T 4101[1]	$299
APS T 3401[1]	499

APS stocks hundreds of CD titles; call our InfoFax today for a document directory at (800) 374-5802.

MAGNETO OPTICAL

Model	Internal*	SR 2000
APS 128MB MO[1]	$769	$799

Mechanism is Epson/Olympus Magneto-Optical

All MO Drives Include 1 FREE Cartridge
128 MO cartridge — $49 unformatted, $55 formatted

TAPE DRIVES

APS T 155 MB Tape Backup❖ $479

155MB Backup Tapes – $19, 10 Pack $170

❖*Only Available in ZFP Case.*

POWERBOOK STUFF

APS SCSI DOC w/PowerMerge $39

Palm-Sized 25–30 PowerBook SCSI Adapter that includes a docking adapter for PowerBook and termination power indicator. Receive Power-Merge Lite Free with every APS SCSI DOC!

APS SCSI BOY $19

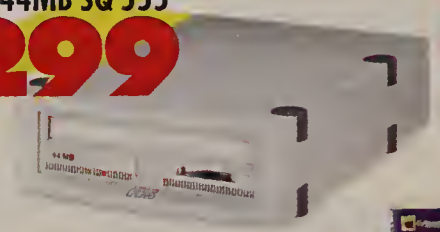
Rugged Palm-Sized 25–30 PowerBook SCSI Adapters

APS PowerBalls $9.99ea

Brighten up that dull granite with a colorful APS PowerBall. Manufactured to the same exacting specifications as the Apple original, the APS PowerBall lets you customize your PowerBook® environment.



APS 44MB SQ 555 **$299**



APS SyQuest

SYQUEST

APS SQ 555[2]	44MB	$299
APS SQ 5110c[2]	44/88MB†	459
APS SQ 3105[1]	105MB	429
APS SQ 3270[1]	270MB	659

† Does not format 44MB cartridges
44MB cartridges — $65 unformatted, $70 formatted
88MB cartridges — $100 unformatted, $105 formatted
105MB cartridges — $59 unformatted, $64 formatted
270MB cartridges — $95 unformatted, $100 formatted
All SyQuest Drives Include 1 FREE Cartridge



APS INTERNATIONAL
Global Storage Resource

APS Intl. Sales Line (816) 920-4109
On parle français au (816) 920-4135
Se habla español en (816) 920-4136
Si parla l'italiano in (816) 920-4137
Wir sprechen Deutsch (816) 920-4138
何卒遠慮なくて日本語でファクスでも申し込みして下さい。
24-Hour Intl. Fax: (816) 483-3077

International Sales

APS Technologies 6131 Deramus Kansas City, MO 64120
M–F 6AM–12Midnight CST. SAT & SUN 9AM–9PM CST.
For a Free Catalog, call APS Sales: (800) 874-1428, InfoFax: (800) 374-5802

Same day shipping for personal checks (Restrictions apply)

Visa, Master Card, Discover, American Express: No Surcharge.

- 30-day money-back guarantee • (Excluding opened software) Your risk is the cost of shipping
- Drive-for-Drive Repair or Replacement Warranty • The warranty length is denoted by the superscripted number next to each drive model. APS will, at its discretion, replace or repair products found to be defective according to the terms of the product's warranty
- All prices and specifications are subject to change without notice
- Refused orders subject to restocking fee
- Hard drives include brackets, cables, cords and LEDs required for operation with the specified Macintosh when applicable. All hard drives from APS Technologies come preformatted with Apple System 7.0.1 software, at least 9 MB of compacted publicly-distributable software and APS Technologies' APS POWER TOOLS SCSI formatter/hard disk partitioner
- All external drive products and cases come with a premium 25 x 50 SCSI cable. Companion II drives, (not cases) include a 30 x 50 PowerBook SCSI cable
- International customers must pay for all shipping charges
- Toll-free technical support as needed. Regular hours are 8 am to 8 pm Monday thru Friday, 9 am to 5 pm Saturday, Central Time.

(800) 874-1428

APS Technologies
Great Products. Priceless Support!

Circle 62 on reader service card



radius™ Free NEC 3Xe CD-ROM

when you buy a 24X Pro or Lemans GT from Bottom Line

PrecisionColor Pro 24XK for $725/PrecisionColor Pro 24X for $825 with rebate

radius

Precision Color 17"/ 21"	$1125/call
★ IntelliColor Display 20i	1849
LeMans GT	1899
Precision Color 20V	1575
★ Precision Color Pro 24X	1245
Precision Color Pro 24XP	439
VideoVision Studio	3299

StageTwo Rocket $1499

WACOM

ArtZ	$272
ArtZ Bundle	469
12x12 UD + Painter	689
12X18 RM	719
Painter v2.0 w/Tablet	199
Painter X2	71
Two Handed Input	115

UD1212RM Tablet $509

RASTEROPS

15" Portrait	$399
20" 20/20c Multiscan	1499
20T" Multi-Scan Trinitron	2399
DuoMate	399
MoviePak w/o Adobe Premier	725
★ PaintBoard Turbo xl	1099
PaintBoard Professional	1299

Horizon 24 $2199

SUPERMAC

Spectrum Power 1152	$1179
★ SuperMatch 20 Txl .	2149
PressView 21" Trin.	3249
★ Digital Film Delux	3199
Thunder II / GX	2299/2699
Spectrum 24 Series V	Call
ThunderStorm	419

Supermatch 17•T $1045

SYSTEMS

Custom Configuration Available	
Duos/PowerBooks/Newtons	Call
PowerMac 6100 60	$1699
PowerMac 7100 66	2555
PowerMac 8100 80	3924
Quadra 610	1349
Quadra 650	1899
Quadra 660AV	1529
Quadra 840AV	2650
Extended Keyboard w/Purchase	79

SCANNERS

HP ScanJet IICX	$929
Leaf Scanner 35 / 45	7499/Call
Microtek 35T/45T	1349/Call
Mirror 600dpi	649
Nikon Coolscan Ext. 35mm Color	1920
ScanMaker II XE / SP	975/ 729
Tamarak 600c w/Photoshop	799
Tamarak 1200	1564

PRINTERS

3M Rainbow Dyesub	Best Price
DataProducts LZR1580	$3069
DEC Laser 1152/5100	649/Call
Deskwriter 550C/310	539/350
Fargo Primera	880
GCC	Call
HP 4ML/4MP	1099/1475
LaserWriter Pro 630/810	2075/4599
LaserWriter Select 360	1525
★ Proof Positive	6695
QMS 860 Plus	5299

INPUT DEVICES

DGR 105 keyboard	$85
Gravis GamePad Mac	29
MacPro Plus 105	115
Other Language Keyboards	109
PowerKey Remote	35
Turbo Mouse ADB V4.0	99

NETWORKING

★ 8 Port Hub 10BaseT	$149
Asante EN/SC 10BaseT	238
Dayna Mini Hub	234
Ethernet for IIsi, Nubus, LC, & SE	99
Ether Wave	Call
MacCon + IIET64	$148
SE30 10BaseT and AUI	99
Starnet 8 10BT Hub	199
★ Thin/10BaseT Transceiver Adapter	49

DRIVES & TAPES

1.9/ 2.5GB Barracuda Drive	$1499/1799
DGR 128/256 Optical	Call
Seagate Hawk 2.4 GB	1539
Granite Active Terminator	39/59
PMO 1.3 GBMac Ext.	2750
Quantum 540 / 1080 Empire	499/899
Quantum 1.8GB	1399
Seagate Elite 3.4GB	2249
Tahoe 128 Optical	920
Toshiba 340 PowerBook	669
Transportable 150 Multidisk	549

SOFTWARE

Business Software

Colleague v3.4	$549
In Control v2.0	80
M.Y.O.B. v3.0	104
Now Contact/Compress	59
Now Up To Date v2.0	59
Quicken 4.0	$41
Touchbase Pro	42

Database Development

4TH Dimension v3.0	$559
MS FoxPro	95
FileMaker Pro 2.1	235
★ Retrospect	139
Times Two v2.0	85

Games

Hellcats Over the Pacific	$37
Where in USA is Carmen San Diego?	27
World Atlas v3.0 CD ROM	47

Presentation/Education

MacAcademy Tapes	$36
★ Macromind Director v3.1	679
★ MS Powerpoint v3.0	299
Personal Training Systems	44
Persuasion v2.12	318

Graphics/Word Processing

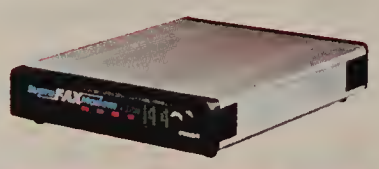
Aldus Freehand v4.0	$369
Collage	189
Color It! CD ROM	79
Debabelizer	275
DesignCad 2D/3D v3.0	143

Sony Monitors



75E	$1199
CPD 1730	1025

Supra Fax Modem



V.32bis MacPac	$215
V.32bis PB	219

Global Village



Gold	$277
Mercury	319

SyQuest Cartridges



44mb Cart.	$59/55
88mb Cart.	89/80
105/270mb Cart.	55/97

BOTTOM LINE DISTRIBUTION

1-512-472-4956

24-Hour Fax 1-512-476-6399 • 1219 West 6th Street • Austin, Texas 78703 USA

Circle 63 on reader service card





1MB TI Memory	$40	★ 630LE Flatbed	$675
57 Font Upgrade for TI	55	630 Flatbed	1039
MicroWriter PS23	679	840 Flatbed	939
MicroWriter PS65	989	1200SE 3000dpi	2799
★ MicroLaser Pro 600 PS65	1465*	Auto Document Feeder	399
PowerStep 40 MHz Upgrade	325	Transparency Adapter	439

TI Pro 600 PS23 $1299*
*includes $60 enduser rebate untill 6/31/94

1260 Flatbed $1175





PowerPro 60/80MHz	$1449/1949	128 IBM Optical	$1049
PowerPro Cache	498	1.3GB Tahiti II Optical	3175
50MHz PowerCache	430	Infinity 40 R	329
FastCache Quadra	335	Infinity 105/270 SyQuest	426/619
Quadra 040	1390	MiniArray 1.0GB	2100
★ Turbo 040 40MHz	1092	PLI CD ROM	569
Turbo 040i 33MHz	739	Quick SCSI	309

Turbo 040 33MHz $975

PLI Infinity 88RW44 $469

Fontographer v4.0	$249
Illustrator v5.0	369
★ Kai's Power Tools 2	95
Kid Pix v1.2	34
★ MacDraw Pro	235
★ MS Excel V4.0/Word 5.1	279
★ Pagemaker v5.0	499
Painter v2.0	249
Photoshop v2.51	499
Quark XPress 3.3	539
Showplace/Renderman v2.0	369
StudioPro	1099
Summasketch Fx	419
Utillties	
AutoDoubler v2.0	$56
Disk Doubler v3.7	49
Disney Collection Screen Savers	32
FontoMatic	39
MacLink Plus/PC v7.0	119
MacTools 3.0	86
Norton Utilities v2.0	89
Quickeys v3.0	102
★ RamDoubler	50
Sam 3.5.8	65
SoftPC /Pro/Windows	95/185/285
Star Trek The Screen Saver	32
Stuffit Deluxe v3.0	63

Suitcase v2.1	$49
Super ATM	92
DISPLAYS	
★ 16"/17" Trinitron	$699/749
Apple 14"/16"	319/1199
Apple AudioVision	699
Futura II SX	419
Lapis Full Page	365
NEC 3FGE 15"/NEC 4FGE 15"	625/715
Sony GDM 17SE1/2036S	1199/2099
Sony 1604S	925
T16II E Machines	1149
ACCELERATORS	
★ DiimoCache 50mhz/FPU	$415/519
Newer Tech. Variable Overdrive	259
Radius Rocket 33Mhz	935
TransWarp 4340 68030-128K 40MHz	379
TokaMac 40MHz 040 FX	1449
MODEMS & FAX MODEMS	
Datalink PB 14.4 int. V.32 bis	$439
GlobalFax Duo Software	79
Hayes	Call
Magic 14.4 V.32 bis Datafax	139
Power/TelePort Bronze II	95
Power/TelePort Silver	259
Supra V.32bis LC Mac Package	155

Call Now For Our Free Catalog

VISA MasterCard DISCOVER DHL FEDERAL EXPRESS

TO ORDER FROM BOTTOM LINE: CALL 512-472-4956. PAYMENT: VISA, MASTERCARD, DISCOVER TAX: TEXAS RESIDENTS ADD 8% SALES TAX. PRICES AND ITEMS SUBJECT TO CHANGE AND AVAILABILITY. MAIL IN/FAX ORDERS ACCEPTED. TERMS: NO CHARGES UNTIL ORDER IS SHIPPED. SHIPPING: MINIMUM $5-UPS GROUND, BLUE, RED, FEDERAL EXPRESS. RETURNS MUST BE IN ORIGINAL CONDITION AND PACKAGE AND REQUIRE AN RMA#. SEAL MUST NOT BE OPENED ON SOFTWARE. RETURNS MAY BE SUBJECT TO A RESTOCKING FEE. BOTTOM LINE DISTRIBUTION CANNOT BE RESPONSIBLE FOR ERRORS IN TYPOGRAPHY OR PHOTOGRAPHY. ORIGINAL SHIPPING IS NON-REFUNDABLE. ALL BRANDS, AND PRODUCT NAMES ARE TRADE MARKS OF THEIR RESPECTIVE HOLDERS.

INTERNATIONAL ORDERS: BOTTOM LINE PROVIDES THE EXTRA LEVEL OF SUPPORT INTERNATIONAL CLIENTS REQUIRE. 24-HOUR INTERNATIONAL FAX LINE. 220-VOLT VERSIONS OF MOST HARDWARE. DHL, UPS, FEDERAL EXPRESS DISCOUNT RATES AND CUSTOMS BROKERAGE. 2-3 DAYS DELIVERY TO MOST COUNTRIES.

B64MW

DGR Technologies



DGR Multi MAX and LC MAX

Upgrade your LC, LCII, LCIII and Performa 400 with the LC MAX. Increase the single expansion slot to four, add another hard drive and supplement your LC with an additional 40 watt power supply. Conflicting cards can be easily switched on or off as needed. Enter the world of Multi-Media with the Multi MAX! Equiped with a multi-session, double spin CD-ROM, and amplified stereo speakers, you can access the vast library of CD-ROMs available or listen to your favorite music.

Multi MAX $799.00 LC MAX $299.00

DGR Power Raid Storage System



High speed RAID technology at a real world price. The DGR Power Raid Storage System is a RAID level 0 and 1 and/or level 0,1,4, and 5 array system. Access time is 4ms with transfer rates up to 10 MB/Sec (Sync) at RAID levels 0 and 1 using a 1.0 GB array on a 840av. The system is compatible with SCSI 1 and 2, SCSI Manager 4.3 (Async), and will work with all Power PC and Mac AV platforms. RAID enclosures are all metal construction complete with all cables and software. The Power Raid Storage System provides its own SCSI chain via a Nubus SCSI 2 card, allowing you to add more RAID enclosures as you need them.

1.0 GB $1,899.00 2.0 GB $2,699.00

DGR Optical Drives

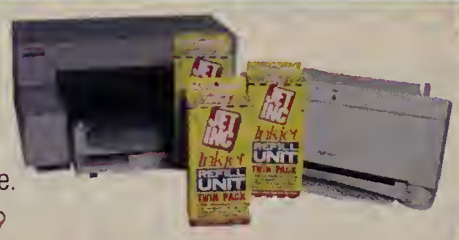
DGR Technologies is committed to the excellence that has made us the industry leader. Each drive is shipped in an all-steel case with a universal 40 watt power supply, double-shielded SCSI cable, external terminator and a free cartridge. (Also for PC's!)



128 MB	$799.00		
256 MB	$899.00	1.3 GB	$2499.00
External PC Adapter	$199.00	Internal PC Card	$149.00

JetInc. Ink Jet Refills

JetInc is the most economical way to refill your ink jet printers. It provides over 50% savings, and incorporates recycled materials to help reduce landfill waste.



2Pk Black/Color	$15.99/$22.99		
2Pk High Capacity Black	$19.99	Apple Color Printer 2Pk	
550C 6Pk	$74.99	Black	$22.95
500c/550c/560c/310 8Pk	$55.95	Cyan/Yellow/Magenta	$29.95

ColorBlaster LC

Blazing 16-bit color graphics on monitors up to 14" using the VRAM slot of the LC, LC II and the Performa 400,405,430. Bundled with ColorIT! $169.00

Colleague Business Software



Colleague Business Software has functions such as appointment calendar; client/prospect file invoicing; job tracking, checkbooks; general ledger; sales,expense, and accounts receivable reports. MacWorld Editor's Choice award and 4 1/2 mice in MacUser. $599.00

800-235-9748

Monday-Friday 8am to 7pm CST DGR Technologies accepts MC, Visa, Discover, Pre-Paid & COD orders.
1219 West Sixth, Suite 205 Austin, Texas 78703 Tel. 512/476-9855 Fax 512/476-9551 AppleLink: DGR

Circle 65 on reader service card

BELOW DEALER COST!
RADIUS SPECIALS



Below Dealer Cost Clearance! All Radius products are ***brand new*** with full manufacturers one year warranty!

All quantities are extremely limited and will be sold on a first come first serve basis. Dealer cost prices are shown below for comparison.

	YOUR PRICE	DEALER COST
RADIUS COLOR DISPLAY/21	$1899	$1989
•1152 x 870 resolution •True WYSIWIG mode •Compatible with Centris or Quadra built in video (16 bit on Quadra 950)		
PRECISION COLOR DISPLAY/19	$1499	$1749
•Multiple resolution switching 'on the fly' •Compatible with Centris or Quadra built in video (16 bit on Quadra 950)		
PRECISION COLOR DISPLAY/19 WITH 24 BIT VIDEO CARD	$2298	$2498
SONY 20 INCH TRINITRON	$1899	$2065
RADIUS 21 INCH GRAYSCALE	$899	$978
•Compatible w/Centris or Quadra built in video •Grayscale •Compatible with the Radius PrecisionColor Calibrator		
RASTEROPS 20 INCH DISPLAY	$1399	$1446
RASTEROPS 20 INCH TRINITRON	$1899	$2209
SUPERMAC SUPERVIEW	$299	$525
•Similar to PowerView but also does TV!		

POWERVIEW $199

Allows most PowerBooks and the Classic II to support color, grayscale, monochrome displays and projectors.
INTERNATIONAL VERSION $349

DEALER COST $435



COLOR PIVOT LE

WITH PURCHASE OF CARD.
We have cards for-
SE/30, LC, IIsi, Nubus, Quadras.

$399

DEALER COST $860



Other Specials!

Apple LaserWriter $499
Postscript Printer - 8 ppm
600 dpi upgrades available.
limited quantity available.

Double the speed of your Mac II, IIx, or SE/30!
Dove 68030 33MHz — *only* $199

Quadruple speeds of your SE or Plus!
Dove 68030 16MHz — *only* $99

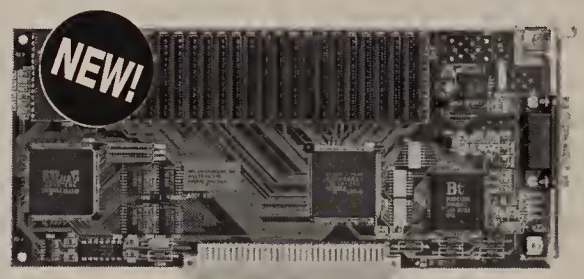
	YOUR PRICE	DEALER COST
E MACHINES COLORPAGE15	$499	$1307
•15" full page color display •35% larger image area •Flat tension mask screen		
GRAYSCALE PIVOT	$499	$535
•Portrait and landscape orientations •Grayscale •Built-in video compatible		
FULL PAGE DISPLAY	$399	$530
•640 x 870 resolution •75 Hz refresh •Grayscale •Built-in video compatible		

ROCKETS/ACCELERATORS

RADIUS ROCKET 68040 FROM $599

•68040 processor •Supports up to 128 MB of standard RAM in 8 SIMM slots •QuickDraw acceleration w/Radius boards

	YOUR PRICE	DEALER COST
RADIUS Rocket 33 MHz	$899	$1248
RADIUS Rocket 25 MHz	$699	$999
RADIUS Rocket 25i MHz	$599	$830
RocketShare- *Multiprocessing on your Mac*	$299	$340
Mac IIci Cache Card	$99	$306
Kodak Device Color Profile accelerator	$1999	$3006
QUADRA 950, 900, 700 33MHz or 40MHz upgrade		$349



RADIUS PRECISIONCOLOR 24X $799

The Radius PrecisionColor 24X is the 'Best Price/Performance Value' *(MacUser-May 92)* 24-bit board on the market!

- Highly integrated 7" card design.
- $1000 plus savings vs. Thunder/24!
- 20% faster QuickDraw than Thunder/24!
- Additional features listed below.

VIDEO BOARDS

•On-board QuickDraw acceleration •24-bit color
•Up to 1152 x 882 resolution •Compatible with virtually all monitors •Supports Nubus block transfer
•Multiple resolution switching 'on the fly'

	YOUR PRICE	DEALER COST
RADIUS UNIVERSAL 24XP	$299	$456
RADIUS UNIVERSAL 24XK	$599	$750
VIDEOVISION	$1299	$1428

CALL FOR ALL OTHER RADIUS VIDEO BOARDS!

Circle 20 on the reader service card

CALL FOR MAC SYSTEMS & PARTS!

Quadra 950 - Below Dealer Cost!!

CPUs

Mac Plus 1/0	299
Mac SE 1/20	399
Mac II 0/0, Rev B ROM	399
Mac IIcx 0/0, 800K/1.4MB	499/599
Mac IIci 0/0, 800K/1.4MB	799/899
PowerBook 170 (active matrix)	1399
PowerBook 140	999
Quadra 840AV, 900, 950, 800, 700	CALL

UPGRADES

Quadra 900 to 950	999
Mac II to IIfx	999
Mac SE FDHD Upgrade	349
Mac II FDHD Upgrade	399

CARDS/MONITORS

TrueVision NuVista+ 2MB	1999
Apple 12" monochrome	199
Apple Token Talk 1/4-4/16	399/599
Apple Serial Nubus Card	399
Apple 8.24 GC	499
Apple 8.24	399
Apple 8 bit video card	199
RasterOps 708+,8 bit for 20"	299
RasterOps 24 xli	1599
RasterOps Editing Aces	2999
RasterOps 24 KXL TV	2399
SuperMac Thunder 24	1699
DCA Mac Irma 3270	499
Ethernet boards for SE/SE 30	99
Shiva FastPath 4 Gateway	999
IIsi NuBus adapter card	99

SOFTWARE

PageMaker 5.0	449
Lotus 123	89
4D 1.06/3.0	399/549
GraceLan 50 User Pack	199
GraceLan Unlimited Corp. Pack	499

INPUT/PRINT

Leaf 45 Film Scanner	12999
Mirrus Film Recorder	2999
Montage FR-1	3495
Howtek ScanMaster III+	4999
HP Scanjet	449
Apple Scanner	449
Exabyte 8mm 5GB tape backup	1599
Maxtor 800MB WORM drive	1499
600MB Read/Write Optical	1999
QMS ColorScript 100 m30 11x17	4999
QMS 4MB Upgrade, legal pack for ColorScript 100 (above)	499
ImageWriter I/II	149/289
ImageWriter Wide/LQ	269/449
Apple LaserWriter 8ppm PS	499

PARTS

Mac Plus logic, No ROMs	99
Mac II logic Rev. B ROM	199
All Logic Boards	CALL
All Power Supplies	CALL
Mac Plus power supply	129
SE-Analog board	129
SE power supply	129
1.44 FDHD Floppy (NEW)	199
400K/800K Floppy Drive	49/99
Apple 5.25 External PC drive	49
Apple ADB mouse (NEW)	59
IIcx case and power supply	199
Mac II/IIfx case & power supply	199
Quadra 700 case & power supply	399
CRT and Yoke from	49
Apple 40MB 3.5" hard drive	49
Apple LQ cut sheet feeder	149
Apple Universal monitor stand	49

Over 20,000 items/parts in stock, if you don't see it — CALL US!

800.375.9000

CRA SYSTEMS

WE BUY MACS!!
Please fax list when possible. Corporate, Government, and University PO's welcome. Prices reflect cash discounts. Mastercard, Visa, AMEX, & Discover Card accepted. Lease/Purchase financing available.

Consultants/Dealers 817.754.2131
International Sales 817.754.2120
TeleFax 817.754.2345

CRA Systems
300 South 13th St.
Waco, TX 76701

Our Break-Through Technology Caught the Competition by Surprise...Wait 'Til They See Our New Prices!

$599

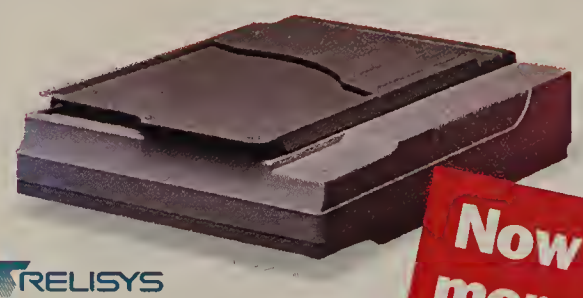


AVEC Colour

Avec Colour 2400

- **2400 dpi Resolution**
- **Free Photoshop LE**

$1499



RELISYS

New Relisys RELI 2412

Now with more DPI!

- **2400 dpi Resolution***
- **Free Transparency Unit**
- **Free Full Photoshop**
- **Free OmniPage OCR**

* Increased hardware resolution now delivers true 1200x300 dpi scanning and interpolation up to 2400 dpi!

30 DAY Special Offer

Now you can have all the features without the high cost.

Before now, buying a quality scanner meant spending a fortune. Relisys' new Cold Scan Technology changes everything. Finally, a family of **full-featured scanners** at prices you can afford!

Dust-Free, Cold Scan Technology. Ordinary hot-lamp scanners rely on a fan to circulate cool air - and dust - throughout the scanning process. But new cold scan technology allows Relisys to fully encapsulate the process. So you get unprecedented, dust-free accuracy.

Exceptional Value. What's more, our new technology is not only superior to the competition's - **it's more affordable!**

Plus, Relisys gives you **free software** with all of our scanners; like Caere OmniPage Direct, so you can scan text directly into your word processing program and Adobe Photoshop for image editing and manipulation.

Call today for details on the complete line, or to order direct.

MacNews Hours: M-TH 8am-7pm; Fri til 6pm (CT) Sat 10am-2pm

MacNews

24HR Fax 1-312-871-4556—International orders welcomed

Order Direct:

1•800•756•5777

MasterCard VISA DISCOVER American Express Cards FEDERAL EXPRESS

Customer Service Hotline: **800-677-3888**

MacNews 1555 Sherman Avenue, Suite 361, Evanston, IL 60201

These offers expire May 31, 1994. Prices subject to change without notice. A 2% surcharge applies to American Express purchases. All returned orders may be subject to a minimum15% restocking fee plus return shipping. Call for manufacturers' RMA before returning. Software, unless defective, cannot be returned after it has been opened.

Circle 262 on reader service card

Got questions?



RASTEROPS®
$2099

RasterOps 20T
20" Multimode Color Trinitron Display. 4 resolutions up to 1152x870.



radius
Call

Radius Precision Color Pivot
Built in video. Full page resolution, portrait and landscape.



AGFA
$999

Agfa StudioScan
600x300 dpi, interpolates to 2400 dpi, with Free Photoshop LE, FotoTune LE & FotoSnap

AVEC Colour
$599



Avec Colour Scanner
600 dpi color scanner, interpolates up to 2400 dpi, with Free Adobe Photoshop LE.

Displays & Cards

RASTEROPS®

20/20C 20" color multimode display	1549
PaintBoard Turbo XL	1149
New! PaintBoard Lightening	799

radius

Precision Color Display/17	1299
IntelliColor Display/20	1999
VideoVision Basic/Studio	Call/Call

E-MACHINES

E-Machines T16 II	1149
E-Machines Futura II SX 24-bit card	Call
E-Machines NEW Futura II LX	789

LAPIS
$1049



Lapis 17T
17" Multi-resolution, Color Trinitron.

15" Full Page Gray Scale Display	419
Two Page Gray Scale Display	619
LTV LC/LTV Portable	259/349

Gray Scale & Color Video Cards for All Macs Call for Pricing

SUPERMAC™

SuperMac 20TX•L / 21TX•L	2299/Call
Spectrum Power • 1152 (7")	1259
Thunder /24 w/Free DSP!	1699

PHILIPS
$529



Phillips 15" Color Display with built-in Speakers

Scanners

UMAX
$1199



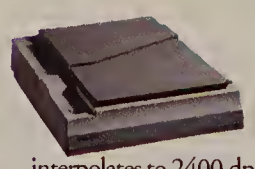
Umax UC 1260
1200 dpi, 24 bit color, with free full Photoshop

UC630LE /UC840	699/929
Umax 1200SE	2499

AGFA

Agfa StudioScan	999
StudioScan Trans. Option	499

RELISYS
$929

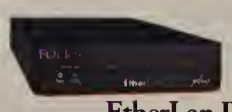


RELI 2412LE
1200x300 hardware dpi, interpolates to 2400 dpi w/ Photoshop LE and free OmniPage OCR.

RELI 2412T 1200x300dpi hardware resolution. Interpolates to 2400 dpi, w/full Photoshop, Free OmniPage OCR and Free Transparency Option.	1499
RELI 9600DPI 1200x600 dpi hardware resolution. Interpolates to 9600 dpi, w/full Photoshop and Free Transparency Option.	2999

Networking

FOCUS enhancements
$259



EtherLan Print
Now connect 2 printers to your Ethernet network, introductory price

EtherLan Print Plus (6 printers)	349
Turbo Net Phone Connectors	19
Transceivers Thin or Thick	79
EtherLan Hub 8/TurboStar 16	229/439
EtherLan Cards/Card 10 Paks	Call/Call

Accelerators

DAYSTAR DIGITAL
PowerPC™ Call for prices on Power Mac upgrades

New Power Pro 601 66MHz/88MHz	Call/Call
Universal Turbo 040, includes FPU 25MHz/40MHz	929/1049
Optional 128k cache for 040	169
Universal Power Cache, includes FPU 33MHz/50MHz	369/529
Fast Cache Quadra 610, 650, 700, 800, 900, 950	289

Storage

FOCUS enhancements

44 MB Removable Drive	329
88R/W44 Removable Drive	449
105 MB 3.5" Removable Drive	459
128 MB Optical Drive	999

PLI
New!
$629



270 MB Removable Hard Drive
unlimited storage and unprecidented speed in a compact 3.5" Syquest format.

FWB Incorporated

PockerHammer 1GB Int. HD	1299
PocketHammer 2GB Int./Ext.	2199/2399
SledgeHammer 4.08GB, 4100 FMF Wide Disk Array	Call
Hammer PE 130MB Mag. Optical	999
JackHammer SCSI Accelerator	629

Modems

Legend 14.4, Super Fax 179
V. 32bis High Speed Send/Receive Fax Modem - Lifetime Warranty

Printers

GCC TECHNOLOGIES
$5999



SelectPress 1200
12x19, 1200 dpi

New Elite 600, 600dpi, 10 ppm	Call
PLPII, 300dpi, w/free ATM	529
Eclipse4, 4ppm	879

newgen

Turbo PS/660p, 600 dpi, 8mb	1499
Turbo PS/880p, 800 dpi, 12mb	1849
Imager Plus 6L 11x17, 600 dpi	3799
Imager Plus 12 12x18, 1200 dpi	Call

TEXAS INSTRUMENTS

TI microWriter PS23	699
TI microLaser Pro 600 PS23	1399

Multimedia

Legend
$499



Multimedia Super System
Featuring High Performance, Double Speed, Multisession CD ROM Complete with Powerful Stereo Speakers, Headphones, Microphone and 5 popular CD titles.

CD-Titles

Reference 7-Pak Bundle Includes Fact Book, Washington Times, Grolier'sEncyclopedia and More!	199
Desk-Top Publishing 7-Pak Bundle Includes Fonts, Clip Art, Grolier's Encyclopedia and More!	199

Ask About Other Special 7-pak Bundles Only $199

Mac News

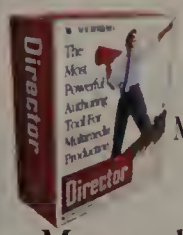
1-800-723-7744

International Orders Welcomed – 24hr Fax 312-871-4556

- *220v Products In-stock*
- *Low-cost International Shipping Rates*
- *Resellers Welcomed*
- *International Orders Shipped Daily*

Apple, the Apple logo, Macintosh, Macintosh Quardra and Power Macintosh are trademarks of Apple Computer, Inc. Prices subject to change without notice. A 2% surcharge applies to American Express purchases. All returned orders may be subject to a minimum15% restocking fee plus return shipping. Call for manufacturers' RMA before returning. Software, unless defective, cannot be returned after it has been opened. All warranties on Macintosh or Apple brand products sold by MacNews will be honored by MacNews or its authorized agents only. All other manufacturer's warranties still apply.

Get Answers!

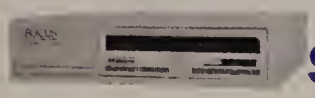


MACROMEDIA

$799

Macromedia Director 4.0
The most advanced set of cross-platform authoring tools ever!

FOCUS enhancements



$449

FOCUS 88R/W44 MB Removable Drive
Includes free cartridge.
Speedy 20 ms access time.



GCC TECHNOLOGIES

$3799

GCC SelectPress 600
PostScript, 600 dpi, 11x17, edge-to-edge laser printing.

Software



Adobe Illustrator 5.0 Software

$369

Adobe Photoshop 2.5	539
Adobe Premiere 3.0	429



ALDUS PAGEMAKER.

$549

Aldus FreeHand 4.0	379
Aldus Fetch	199



Specular International

$429

Infini-D 3D Software
Award winning 3D graphics & animation.
New Native Power PC version!

Specular Collage	219
Logo Motion	109

Special Bundles

Kai's POWER TOOLS

$89



Kai's Power Tools 2.0 with free ColorIt! & Stuff•It Space•Saver
33 plug-in filters and extensions for Photoshop - now includes ColorIt! and award winning compression software.

STUFFIT

$99 **Aladdin Stuff•It Deluxe & Maxa Alert**
Choose award winning compression software with archiving and security features & get free hardware diagnostic software.

Stuff•It Deluxe/Space Saver	69/39
Maxa Alert	99

Systems

Apple™

PowerPC™

We've got the answers.
Call us today!



MacintoshQuadra 840 AV Color Publishing System **$5,899**
840 AV w/CD ROM drive, FPU, Ethernet, 8 MB RAM/230 MB HD, RasterOps 20T, 20" Color Trinitron Display, Lightening 24-bit video accelerator card, extended keyboard & System 7.1.

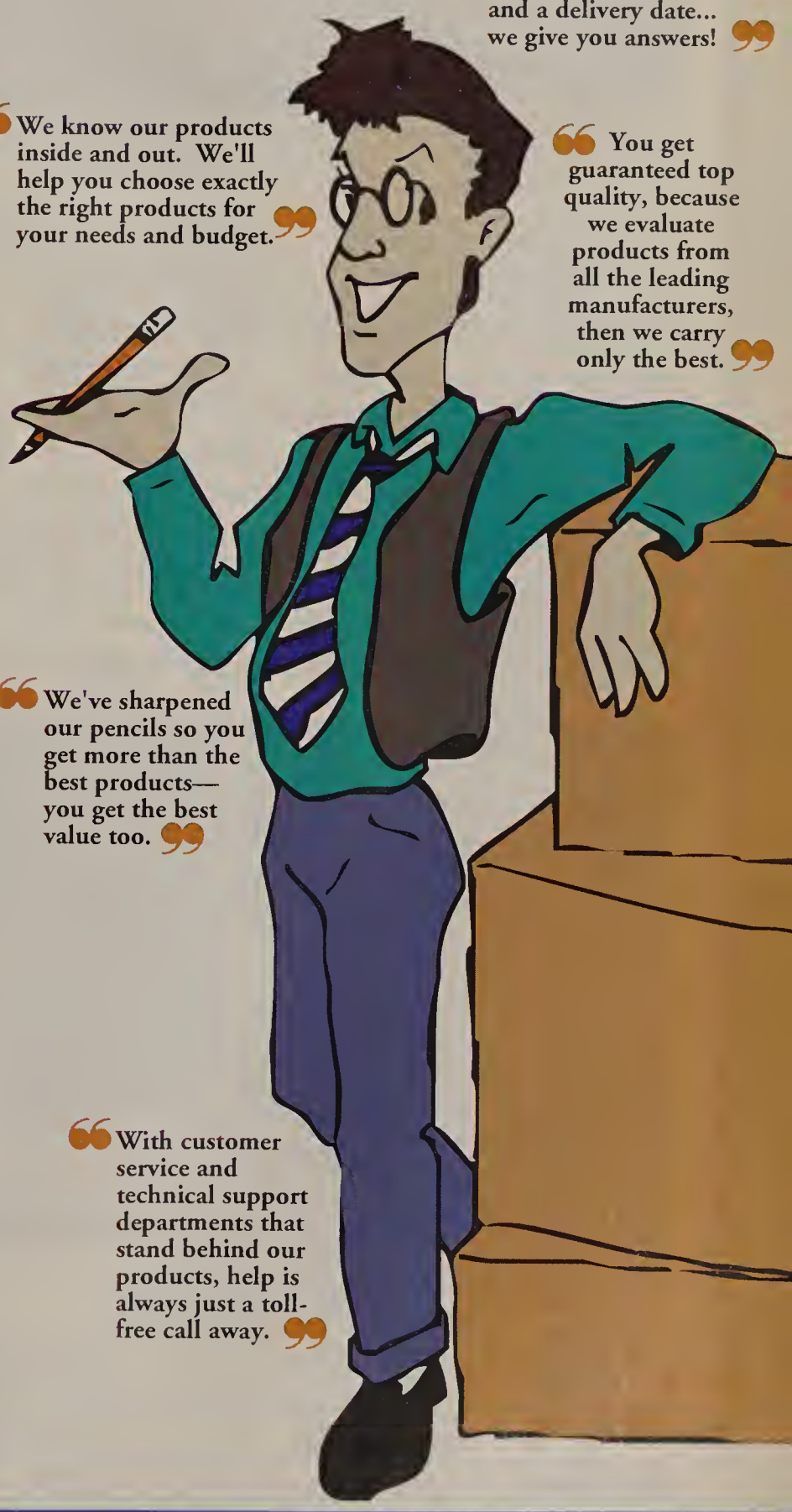
Mac Quadra 650 Publishing System **$3,899**
650 w/FPU, Ethernet, 8 MB RAM/ 230 MB HD, 16" Color Trinitron Display, 24-bit video accelerator card, extended keyboard & System 7.1.

• Add Legend Multimedia Super System. Includes CD ROM drive, stereo speakers, headphones & 5 popular CD ROM titles all for only **$499**

PowerMac 6100 PowerPC System **$2,399**
6100 w/FPU, Ethernet, 8 MB RAM/ 160 MB HD, Philips 15" Brilliance Display with built-in stereo speakers, extended keyboard & System 7.1.

PowerMac 8100 Workstation System **$9,299**
8100 AV w/CD ROM drive, FPU, Ethernet, 16 MB RAM/500 MB HD, SuperMac 20TX•L, 20" Color Trinitron Display, Thunder /24, 24-bit video accelerator card w/DSP, extended keyboard & System 7.1.

Call for custom configurations.



"At MacNews, we give you more than a price quote and a delivery date... we give you answers!"

"We know our products inside and out. We'll help you choose exactly the right products for your needs and budget."

"You get guaranteed top quality, because we evaluate products from all the leading manufacturers, then we carry only the best."

"We've sharpened our pencils so you get more than the best products—you get the best value too."

"With customer service and technical support departments that stand behind our products, help is always just a toll-free call away."

MacNews

1555 SHERMAN AVENUE SUITE 361 • EVANSTON, IL 60201

MacNews Hours: M-TH 8am-7pm; Fri til 6pm (CT) Sat 10am-2pm

1-800-723-7744

24hr Fax 312-871-4556 • International Orders Welcomed

Customer Service Hotline: 1-800-677-3888

Circle 172 on reader service card

1-800-258-2622 1-800-CLUBMAC

Quantum

ClubMac 30 DAY MONEY BACK GUARANTEE



A ClubMac Quantum Drive is the best "plug-and-play" storage salution far your Macintash computer. All Quantum drives are backed by ClubMac's 30-Day Maney Back Guarantee and TWO Year Warranty. (Ga•Drives include ONE Year Warranty).

GO•DRIVE SERIES
2.5" POWERBOOK DRIVES

Capacity	Access	Internal	External
170mb	17ms	$259	$379
256mb	17ms	$339	$459

GO•DRIVE SERIES
The Quantum Go•Drive Series are fast, lightweight, advanced 2.5-inch hard disk drives. Go•Drives are perfect for use with Apple PowerBooks with available capacities from 170MB to 256MB.

ELS, LPS AND PRODRIVE SERIES
The Quantum 3.5-inch hard disk drives are the optimal storage solution for entry level Macintosh systems to arrays of high-end workstations and network file servers. Available capacities from 170mb up to 1800mb. Quantum drives offer average seek times al low as 9.5ms, transfer rates up to 10 MB/sec, and SCSI-1/SCSI-2 interface. Performance enhancements include Quantum's Proprietary DisCache and WriteCache firmware.

QUANTUM DRIVES
3.5" LOW PROFILE, LOW POWER

Capacity	Access	Internal	External
170mb	17ms	$185	$245
3.5" LOW PROFILE			
270mb	11ms	$239	$299
340mb	11ms	$289	$349
540mb	11ms	$469	$529
540mb	9.5ms	$549	$609
1080mb	9.5ms	$799	$859
3.5" HALF HEIGHT			
1800mb	10ms	$1079	$1139



FEATURING

SyQuest® REMOVABLE TECHNOLOGY

All SyQuest drives include a TWO Year Warranty.
All SyQuest cartridges cartridges include a FIVE Year Warranty.
All drives include SCSI Directar farmatting software, necessary cables for "plug-and-play" and documentatian.

ClubMac Removables

	Internal	External
ClubMac 44mb 5.25" (SQ555)	$249	$289
ClubMac 88c 5.25" (SQ5110C)	$379	$419
ClubMac 200mb 5.25" (SQ5200) NEW	$559	$599
ClubMac 105mb 3.5" (SQ3105)	$339	$379
ClubMac 270mb 3.5" (SQ3270)	$619	$659

CARTRIDGES

44mb (SQ400)/105mb (SQ310)	$59
88mb (SQ800)	$89
200mb (SQ2000) NEW	$99
270mb (SQ327)	$99

ClubMac 30 DAY MONEY BACK GUARANTEE

DAT BACKUP by CLUBMAC



CLUBMAC DAT
DDS & DDS-DC DRIVES

- 2 to 4 Gigabytes at pennies per Megabyte
- 20 sec average data access time (60m tape)
- 14mb/min backup rate, 180KB/sec transfer rate
- MTBF of 60,000 haurs
- TWO Year Warranty
- Includes RetroSpect v.2.0 BackUp Saftware and ONE 90m Tape Cassette

FREE RETROSPECT V2.0 BACKUP SOFTWARE ($139 VALUE)



CLUBMAC DAT/2
DDS-2 DRIVE

- 20 sec average data access time (60m tape)
- 28mb/min backup rate, 366KB/sec transfer rate
- MTBF of 180,000 hours
- ONE Year Warranty
- Includes Retrospect Remote v.2.0 (3 pack) Network Backup Software and ONE 120m Tape Cassette

FREE RETROSPECT REMOTE V2.0 BACKUP SOFTWARE ($249 VALUE)



Capacity	Model	Format	Media	Internal	Exter
2.0GIG	ClubMac DAT	DDS	60m, 90m	$749	$79
2-4GIG	ClubMac DAT/DC	DDS-DC	60m, 90m	$999	$104
4-8GIG	ClubMac DAT/2	DDS-2	60m, 90m, 120m	$1329	$137

Verbatim MEDIA PRODUCTS

DAT TAPES	ea	10 pack
4mm (60m)	$12	$110
4mm (90m)	$15	$125
4mm (120m)	$29	$250

OPTICAL MEDIA	
3.5" 128mb	$35
5.25" 594mb/652mb	$89
5.25" 1.2GIG/1.3GIG	$115

CLUBMAC OPTICAL DRIVES



CLUBMAC 3.5" 128MB OPTICAL

"Law price and all-around value characterize this 128mb rewritable drive."
-Macworld Editors' Choice December 1993



CLUBMAC 5.25" 650MB OPTICA

"Withaut questian the best bargain amang 5.25" drives.
-Macworld Editors' Choice December 199

	Internal	External
ClubMac 3.5" 128mb Fujitsu Optical (M2511A)	$839	$86
Fujitsu 3.5" 128mb Dynamo		$86
ClubMac 3.5" 128mb Epson Optical	$759	$78
ClubMac 5.25" 650mb Sharp Optical	$1669	$169
Hewlett-Packard 5.25" 1.3GIG Optical External		$269

All ClubMac Opticals include ONE cartridge and ONE Year Warranty.



Seagate

ClubMac 30 DAY MONEY BACK GUARANTEE

Seagate drives offer the highest performance a capacity at a price point that is affordable far a Macintosh user. Capacities range fram Gigabyte to 2.4 Gigabytes. Seagate surpasses t competitian with an industry-leading 7200 RI ratation speed which makes far the fastest drive

Unformatted Capacity	Model	Description	Access Time	Actual MAC Capacity	Internal	Externa
3.5" LOW PROFILE						
1.2GIG	ST31200N		10ms	1000mb	$869	$92
3.5" HALF HEIGHT						
1.9GIG	ST11900N		9ms	1600mb	$1199	$125
2.4GIG	ST12400N		9ms	2000mb	$1549	$160
1.9GIG	ST11950N	*Barracuda 1*	8ms	1650mb	$1489	$154
2.4GIG	ST12550N	*Barracuda 2*	8ms	2050mb	$1745	$180

NEC MultiSpin CD-ROM Readers

MultiSpin 3Xe



The 3Xe is aur highest perfarming triple speed external reader. It transfers data at 450 KB/sec, has an incredible 195ms access time and a 256 KB cantinuaus-flow cache. Anather MultiSpin 3Xe ErgoDesign feature is that it can be used in either a harizantal ar vertical arientatian.

MultiSpin 3Xp



Far users that want ta discaver the warld af multimedia the 3Xp Persanal CD-ROM reader is perfect for use in the office, hame or an the raad. It cambines 3X transfer rate perfarmance, 250ms access time and a 256 KB cantinuaus-flaw cache in a compact design, making it an incredible value.

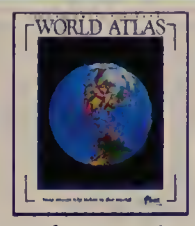
	w/a bundle	w/bundle
MultiSpin 3Xe (CDR-600) (External, 195ms access time)	$589	$689
MultiSpin 3Xi (CDR-500) (Internal, 195ms access time)	$499	$599
MultiSpin 3Xp (CDR-400) (Partable, 250ms access time)	$439	$539
MultiSpin 4X Pro (CDR-900) (External, 180ms access time)	$935	$1035

NEC MultiSpin CD-ROM Readers include Macintash Interface Kit and a TWO Year Warranty. NEC MultiSpin CD-ROM readers are MPC Level 2, QuickTime and Kadak Multisessian Phata CD campliant.

CLUBMAC CD BUNDLE $800 RETAIL VALUE!



The Animals



The Software Toolworks Atlas Pack (World) v3.0



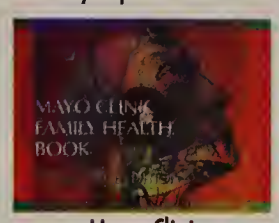
The Software Toolworks Atlas Pack (US) v3.0



The Software Toolworks Encyclopedia v6.0



Lucas Game Pack II



Mayo Clinic



Pair of QuickShot Speakers

NETWORKING



ASANTÉ

10THUB/12	10BT Hub w/12 10T, Thk & Thn parts	$465
10THUB/8	10BT Hub w/8 10T, Thn part	$229
Mini EN/SC	Thn/10BT SCSI Ether w/DT& PB cable	$297
Mini EN/SC10T	10T SCSI Ethernet w/DT & PB cable	$237
FN10TA	10T FriendlyNet Media Adapter	$65
FNTNA	Thn FriendlyNet Media Adapter	$65
MC+IIE64	Mac II & Perf 600, Thk/Thn, 64K	$139
MAC+IIET64	Mac II & Perf 600, Thk, 10BT, 64K	$139
MC3NB	Mac II & Perf 600, Thk/Thn/10BT, 64K	$189
AP1001	AsantéPrint, Thk/10BT ar Thk/Thn	$329

FIVE YEAR WARRANTY

APPLE MACINTOSH 7 SYSTEM 7 COMPATIBLE

Sonic Systems, Inc.

NETWORK PRODUCTS



microSCSI

Ethernet Adapter Products

3 in 1 Card (Nubus, PDS, SE, LC)	$125
Thick/Thin Card (Mac II, LC)	$89
Thick/10BaseT Card (Mac II, LC)	$89
micraSCSI PawerBaak	$235
micraSCSI Desktap	$219
Apple AUI Ethernet Adapters (Quadras, Centris, Lasers, WGS)	
Single Part 10BaseT ar Thin	$49
Dual Part 10BaseT and Thin	$75
Multiple AAUI praducts	$89



StarBase T/9

Ethernet Hubs

StarBase T 9 Part (8-RJ-45, 1 BNC)	$197
HubLite 5 Port 10BaseT Hub	$145

DAYSTAR DIGITAL

3 Year Warranty · 100% Compatible · Money Back 30 Day Guarantee



POWERPC PRODUCTS

66 MHz PowerPro 601 (000728)	$1499
80 MHz PowerPro 601 (000735)	$1999
FastCache PowerPro-1MB Cache (000742)	$499

TURBO 040 ACCELERATORS

Turbo 040 (with FPU support)

33 MHz Turbo 040 w/128K cache (000773)	$799
40 MHz Turbo 040 w/128K cache (000797)	$959
FastCache Turbo (000223)	$165

Turbo 040i (w/o FPU support)

33 MHz Turbo 040i w/128K cache (000780)	$629

APPLICATION ACCELERATORS

Image 040 (Quadra/Centris) (000414)	$1549
Quad 040 w/128K cache (Quadra/Centris) (000056)	$959

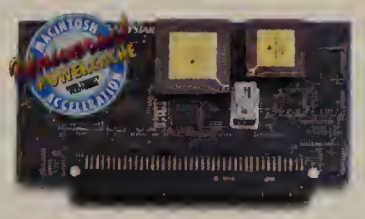
POWERCACHE

	W/O FPU	W/FPU
33 MHz PowerCache (P31UV-033)	$275	$359
50 MHz PowerCache (P31UV-050)	$415	$539
PowerCache Adapter*	$99	

* Req'd for nan-Mac IIci, IIvi, IIvx, Performa 600

Turbo 040i (without FPU)
- Ideal far ward pracessing, spreadsheet (except recalcs), page layaut and graphic applicatians
- The inexpensive, aptianal FastCache Turbo (128K cache) is available far achieving maximum '040 perfarmance
- Supports Mac SE/30, II, IIx, IIcx, IIsi, IIci, IIvi, IIvx and Performa 600

Turbo 040
- Includes complete Matarala 68040 CPU with math chip. Ideal far imaging, rendering, complex spreadsheet recalcs and scientific applicatians
- Supparts the Mac SE/30, II, IIx, IIcx, IIsi, IIci, IIvi, IIvx and Performa 600



Universal Powercache

The award-winning PawerCache is a 68030 CPU acceleratar that affers speed increase fram 200% far a Mac IIci ta 1,000% far a Mac Classic. It's guaranteed 100% campatible running at full speed and daesn't require additianal memary. Just plug it and ga... na downtime and it warks with everything.

Warranties: All items manufactured by ClubMac are returned to ClubMac far warranty repair. All ather items carry manufacturer's warranty. Maney Back Guarantee: All products manufactured by ClubMac carry a 30 day maney back guarantee. ClubMac extends all ather manufacturers' return policies ta its customers. Nan-ClubMac products carry 30 day maney back guarantee when specified. Returns: Call far RMA number! Any product that is returned WITHOUT an RMA number will be refused. All product information and prices are subject to change without natice. Nat responsible far typographical errors.

VISA · MasterCard · American Express

No Surcharge!

ClubMac

1-800-258-2622

Info (714)768-8130 • Tech Support (714)768-1490
Fax (714)768-9354 • 7 Hammand, Irvine, CA 92718

MacWorld June 1994

1-800-258-2622 CLUBMAC 1-800-258-2622

1-800-CLUBMAC 1-800-258-2622

EPSON

Epson ES-800C Pro-Mac



ES-800C Pro-Mac $1249
Scans up to 1600dpi, PhotoShop 2.5, ScanTastic, KAI's PowerTools

ActionScanning-Mac $799
Scans up to 1200dpi, PhotoShop 2.5 LE & ScanTastic

MICROTEK

Better Images Through Innovation.

Microtek ScanMaker IIsp



ScanMaker IIsp with Photoshop 2.5 LE $799
ScanMaker II with Photoshop 2.5 LE $665
ScanMaker IIxe with Photoshop 2.5 ..... $1049
ScanMaker IIg with Fractal Design Sketcher 1.0 ... $489

AGFA

Agfa StudioScan

...StudioScan from AGFA.
So much scanner for so little money...



Agfa StudioScan (FSERA) $999
StudioScan Transparency Module (FSEQ7) $375

ClubMac Extended Keyboard



Available in the following version:
- English (K8)
- Spanish (K8-SP)
- Swiss (K8-SW)
- French (K8-F)
- German (K8-G)

Includes ONE Year Warranty

Turbo Mouse 4.0 (C4100)



MACWORLD MW ★★★★
November 1992

MACWORLD MW EDITORS' CHOICE
February 1992

- Two Apple Desktop Bus (ADB) Ports
- Large Ball for greater control
- Superior Hardware Design
- Optical Technology
- Programmable Button Commands
- 5 Year Warranty

KENSINGTON®

SONY®

SONY 17" TRINITRON



Sony 17SE1 Trinitron monitor
This new 17-inch Trinitron display features a unique Application Specific Integrated Circuit (ASIC), supports resolutions up to 1600 x 1200 at 60Hz, has a 0.25mm Aperture Grille Pitch and is Energy Star compliant

MONITORS
17" MultiScan Trinitron (GDM-17SE1) .. $118
17" MultiScan Trinitron (CPD-1730) ... $107

SUPERMAC™

Free DSP for a limited time!



Thunder/24 v2.0
Fastest 24-bit accelerated color graphics. It is 45% faster. Provides high performance QuickDraw acceleration on 12-21" displays at resolutions from 512 x 384 to 1152 x 870 pixels.



Spectrum Power • 1152
Delivers workstation-class, accelerated 24-bit graphics up to 1152 x 870 so you can work with a full, 16.7 million colors on screens up to 21 inches and execute QuickDraw functions up to 31 times faster than unaccelerated video. And it's 7-inch length enables it to fit into any NuBus Macintosh, even the Quadro 610 and 660AV.

24-BIT GRAPHIC ACCELERATORS
Thunder/24 v.2.0 (G1130) $1699
Spectrum Power • 1152 (G3430) $1169
Spectrum/24 Series V (G3930) $839

LARGE SCREEN DISPLAYS
SuperMatch 21TXL Trinitron (STD2102) $2199
SuperMatch 20TXL Trinitron (STD9752-XL) ... $1949
SuperMatch 20 Plus Color (STD9785) $1649
SuperMatch 17T Trinitron (STD9735) $1049
SuperMatch 17XL (STD1701) $999
Platinum 21 Two-Page GS (STD9761) $999

MULTIMEDIA SOLUTIONS
Digital Film (DV2050) $3199
Spigot II Tape (DV1530) $849
Video Spigot NuBus (DV1030) $369
Video Spigot LC (DV1050) $249



MacUser Magazine ★★★★
January 1993

E-Machines T16 II

E-MACHINES

E-MACHINES MONITORS
ColorPage T16II (1108-DT16MR) $1169

E-MACHINES GRAPHIC CARDS
24-Bit Futura II SX (EMG013S) $419
Simply TV (EMG0550) $369

DUO DOCKING STATIONS
PowerLink Presenter (5008-PLP) $419
EtherDock (5008-PLD) $589

RASTEROPS® CORPORATION



PaintBoard Lightning
The PaintBoard Lightning is a highly accelerated 24-bit NuBus graphics adapter. It delivers exceptional photo-realistic true color up to resolutions as high as 1024 x 768 making it ideal for imaging, color publishing and business productivity.

MONITORS
20"/20T Trinitron (2075RO) $2489
20/20 Multiscan Color (2020C) $1519
21" Mono/GrayScale (2110) $995
17" ClearVue Color $869

DUOMATES
DuoMate 8 (2658) $329
DuoMate 16sc (2659) $519



GRAPHIC CARDS
PaintBoard Lightning (2685) $77
Horizon 24 (2678) $225
PaintBoard Turbo XL (2695) $112
PaintBoard Professional (2716) $179
PaintBoard 8Li (2641) $31

MULTIMEDIA
MoviePak Presenter (2690) $139
MoviePak2 (2676) $154
MoviePak2 Pro Suite (2692) $328
24XLTV (2548) $252
24STV (2536) $71
Video Expander II (2826) $49

The RasterOps DuoMate 16sc combines SCSI interface with support for a variety of bit depths up to 16-bit per pixel (depending on the monitor and resolution). The SCSI interface may be used to connect an external hard disk or other devices such as a SCSI Ethernet adapter. SCSI disk mode is supported to ease file transfers.

radius



ASK ABOUT RADIUS WORRY-FREE WARRANTY

MONITORS

PrecisionColor/21 NEW	$2149
IntelliColor Display/20 (0381)	$1929
PrecisionColor Display/20v (0427)	$1679
PrecisionColor Display/17 (0460)	$1249
PrecisionColor Pivot (0356)	$649
Pivot Display (0356)	$565
Full Page Display (FPD) (0424)	$489
TPD/20gs/21gs (0436) / (0437)	$799/$1005

GRAPHIC CARDS

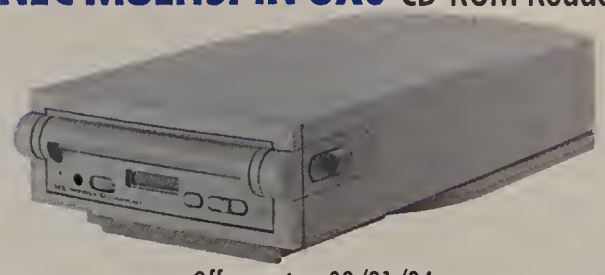
LeMansGT	$1949
PrecisionColor Pro 24X (0429)	$1349
PrecisionColor Pro 24XK (0422)	$735
PrecisionColor Pro 24XP (0431)	$435
PrecisionColor 24X (0422)	$844

MULTIMEDIA

VideoVision Studio (0418)	$3389
VideoVision Studio Upgrade (0419)	$1529
VideoVision (Basic) (0416)	$1499

Get a FREE CD-ROM READER

Purchase one of the following Radius graphic cards:
LeMansGT or
PrecisionColor Pro 24X
and get a ***FREE***
NEC MULTISPIN 3Xe CD-ROM Reader



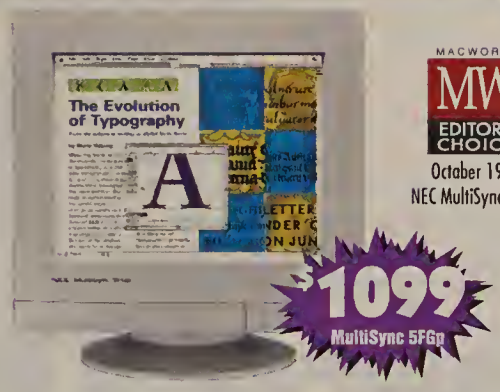
Offer expires 08/31/94

NEC

MULTISYNC 6FGp



MULTISYNC 5FGp



MACWORLD MW EDITORS' CHOICE
October 1993
NEC MultiSync 5FGp

NEC MULTISYNC MONITORS

15" MultiSync 3V (JC-1535VMA)	$469
15" MultiSync 4FGe (JC-1531VMA-3)	$629
17" MultiSync 5FGe (JC-1731VMA-3)	$989
17" MultiSync 5FGp (JC-1741UMA-3)	$1099
21" MultiSync 6FGp (JC-2141UMA-3)	$1999

NEC Manitors carry a THREE Year Warranty.

SILENTWRITER 640



The NEC's SilentWriter Madel 640 is a personal laser printer designed especially far the Macintash. This campact, easy ta aperate printer delivers an unbeatable cambinatian af prafessianal level perfarmance and print quality at a price mast any Mac awner can affard.

NEC PRINTERS

Silentwriter 640 (640) 6ppm, 300 dpi, PS Level 2, 52 fants	$719
Silentwriter 1097 (1097)10ppm, up la 600 dpi, PS Level 2	$1379

NEC Silentwriter 640 carries a TWO Year Warranty.
NEC Silentwriter 1097 carry a ONE Year Warranty.

HEWLETT PACKARD

Authorized Dealer

HP DeskWriter 520



- Clear, sharp 600 x 300 dpi
- 3 ppm, 35 scalable fonts
- Light weight, anly 4.3 lbs.
- Prints an plain paper, transparencies
- Standard LacalTalk/Serial interface
- EnergyStar Campliant

HP DeskWriters carry a THREE Year Warranty

HP DeskWriter 310 Optional Color Kit Available	$299
HP DeskWriter 310 with Cutsheet Feeder (60-sheet), Optianal Color Kit Available	$369
DeskWriter Inkjet 520 600 x 300 dpi, 3ppm, 35 fants, LacalTalk/Serial NEW	$299
DeskWriter Inkjet 560C 600 x 300 dpi color, 3ppm, 35 fonts, LacalTalk/Serial NEW	$579

HP DeskWriter 310 carry a ONE Year Warranty

HP LASERJET 4ML



- Lowest cost HP LaserJet printer for the Mac
- EconoMode cuts your toner costs up to 50%
- Lightning fast Intel 80960 18.8 MHz RISC processor
- Auto-switching between PostScript and enhanced HP PCL 5
- 300-dpi laser printing with HP Resolution Enhancement technology & 4ppm
- 35 PostScript fonts
- 4MB standard memory
- Small 14" x 14.5" footprint saves desktop space
- ONE Year Warranty

HP LaserJet 4ML 300 x 300 dpi, 4ppm, 35 scalable fants, Adobe PostScript Level 2	$1029
HP LaserJet 4MP 600 x 600 dpi, 4ppm, 35 scalable fants, Adobe PostScript Level 2	$1395

CALL FOR FREE CATALOG

DISCOVER NOVUS VISA MasterCard American Express

No Surcharge!

ClubMac

1-800-258-2622

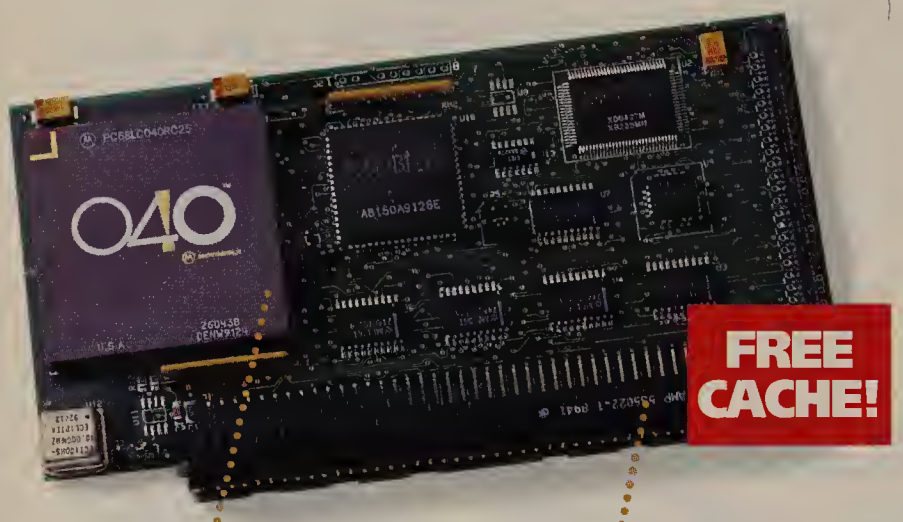
Info (714)768-8130 • Tech Support (714)768-1490
Fax (714)768-9354 • 7 Hammond, Irvine, CA 92718

MacWorld June 1994

1-800-258-2622 1-800-CLUBMAC 1-800-258-2622

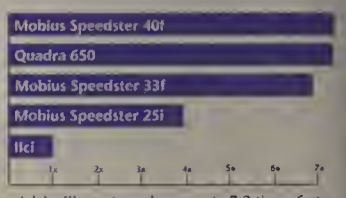
Circle 96 on reader service card

'040 Performance Now only $399.



100% Compatibility Guarantee with all Macintosh software or your money back.

Easy 10 minute installation on the Mac IIci, IIsi, IIcx, IIx, Perf. 400, LC and LC II.



Adobe Illustrator redraws up to 7.3 times faster with the Mobius Speedster 040 Accelerator.

Now is the best time to accelerate your Macintosh with the Speedster 040. Starting at just $399, you can upgrade to '040 power and get blazing, 100% compatible performance from the Mac you already own. **Speedster 040 runs all your software up to 6X faster!** Plus, its universal, low-cost design uses custom chips, **saving you up to 50% over the competition.** At Mobius, we stand behind you with a 3-year warranty, 30-day money-back guarantee, and unlimited technical **support rated "Excellent"** by *MacWorld* Magazine. Call today to order and receive your free *Macintosh Performance Handbook*.

Compare and Save!	Speedster 040™	Daystar Turbo 040™
Speedster 25i	$399	$799
Speedster 33i w/cache	$599	$999
Speedster 33f w/FPU & cache	$799	$1,199
Speedster 40f w/FPU & cache	$1,099	$1,399
128K Cache Option	FREE!	$199

The Choice Display for all your work.

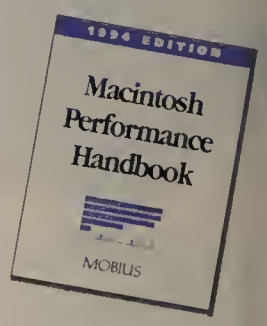


$699 $399

MACWORLD MW EDITORS' CHOICE

Why settle for scrolling around on a tiny 13" monitor when you can **view your entire document** on a award-winning Mobius Display. You'll have over three times more desktop! Just plug it directly into your Macintosh and view up to 256 gray-levels* on the bright, razor-sharp screen. **Now available for over 50 Macs,** Mobius Displays are rated at over 80,000 hours MTBF—the most reliable in the industry. And starting at just $399, the best value you'll find anywhere. So choose the display that *MacWorld* named **"Editor's Choice."** Call us today to place your order, and get the Choice Display for all your work.

Mobius Monochrome Displays	
Mobius Two Page Display GS	$699
Mobius One Page Display GS	$399
Mobius Mono Video Card	$99†



MOBIUS

To Order or Receive Your FREE Performance Handbook:

800-800-4334

Circle 109 on reader service card

**For Macs w/supporting built-in video; video card may be req, call for info. † When purchased with display. How to Order: We accept Visa, MasterCard, AmEx and Discover. Corporate and Education POs. Cache is free with Speedster 33i, 33f, and 40f models only. Competitive pricing as of 3/16/94. All trademarks are property of their respective holders. Mobius, 5835 Doyle Street, Emeryville, CA 94608, (510) 654-0556.*

MEGA HAUS

1-800-786-1184

Our 8th year selling quality drives at incredible prices.

30 Day money back guarantee.

Fast, friendly, and smart service.

Lifetime technical support.

24 Hour turnaround, 1 year replacement policy.

Thank you for your business!

HARD DRIVES

Quantum™

WE HAVE THE DRIVE YOU WANT AT AN UNBEATABLE PRICE!



Capacity	Model	Internal	External
170MB	ELS170S	$179	$239
270MB	LPS270S	$238	$298
341MB	LPS340S	$275	$335
540MB	LPS540S	$444	$504
1080MB	EMP1080S	$779	$839
1800MB	PD1800S	$979	$1039

Capacity	Speed	RPM	Buffer	Brand	Warranty	Internal	External	
105MB	19ms	4464	31K	Maxtor	1 Year	$469 (Type III PCMCIA)		
170MB	17ms	3600	32K	Quantum	2 Years	$179	$239	
240MB	16ms	4306	256K	Quantum	2 Years	$249	$309	
240MB	14ms	4500	256K	Fujitsu	1 Year	$329 (2.5" for Powerbook)		
270MB	12ms	4500	128K	Quantum	2 Years	$238	$298	
340MB	12ms	4500	128K	Quantum	2 Years	$275	$335	
540MB	9.5ms	5400	128K	Quantum	2 Years	$444	$504	
1052MB	9ms	5400	256K	Seagate	5 Years	$779	$839	BEST BUY!
1052MB	8.5ms	5400	256K	Micropolis	5 Years	$799	$849	
1060MB	9ms	5400	512K	Conner	5 Years	$789	$849	
1080MB	9.5ms	5400	512K	Quantum	5 Years	$769	$829	
1080MB	9.5ms	5400	256K	Fujitsu	5 Years	$789	$849	
1690MB	8ms	7200	1024K	Seagate	5 Years	$1459	$1559	
1750MB	10ms	5400	256K	Micropolis	5 Years	$1169	$1199	
1800MB	10ms	4500	512K	Quantum	5 Years	$979	$1039	BEST BUY!
2145MB	8ms	7200	1024K	Seagate	5 Years	$1689	$1769	
2148MB	9ms	5400	512K	Seagate	5 Years	$1429	$1529	
3020MB	11ms	5400	256K	Micropolis	5 Years	$2139	$2169	
9100MB	12ms	5400	512K	Micropolis	5 Years	$4099	$4199	

Includes formatting software and cables.

SYQUEST DRIVES

Capacity	Model	Speed	Buffer	Warranty	Internal	External
44 / 88MB	SQ5110C	20ms	32K	2 Years	$379	$445
105MB	SQ3105	14.5ms	64K	2 Years	$309	$369
270MB	SQ3270	13.5ms	128K	2 Years	$519	$579

Media Qty 1 / 5 88MB $96 / $89ea. 105MB $58 / $56ea. 270MB $93 / $89ea.

Includes 1 Cartridge, formatting software, and cables. Multiple Syquest drive towers in stock!

CD ROM DRIVES

Brand	Model	Speed	Transfer	Type	Internal	External	
Teac	CD-50	265ms	335KB/sec	Single disk	$299	$359	
Toshiba	XM3401	200ms	330KB/sec	Single disk	$349	$409	
NEC	CDR510	195ms	450KB/sec	Single disk	$439	$499	BEST BUY!
Pioneer	DRM-602X	300ms	307KB/sec	6 Disc Changer	n/a	$919	
Pioneer	DRM-604X	300ms	614KB/sec	6 Disc Changer	n/a	$1169	
Pioneer	DRM-1804X	300ms	614KB/sec	18 Disc Changer	n/a	$2099	

Includes driver software with music play, $25 Photo CD processing coupon, and cables. Multi Drive CD Towers in stock!

TAPE DRIVES

Capacity	Type	Brand	Speed	Internal	External	
250MB	QIC 150	Archive	7MB/min	$459	$529	
2Gig	DAT	Conner	11MB/min	$839	$899	
2Gig	DAT	Hewlett Packard	12MB/min	$959	$1019	
4-8Gig	DAT	Conner	88MB/min	$1269	$1329	
4-8Gig	DAT	Hewlett Packard	42MB/min	$1089	$1109	
4-10Gig	DDS-2 DAT	Sony	88MB/min	$1139	$1199	BEST BUY!
4-10Gig	DDS-2 DAT	HP (Fastest Tape!)	88MB/min	$1449	$1499	

Includes Retrospect 2.0 (#1 backup software), 1 tape, and cables.

OPTICAL DRIVES

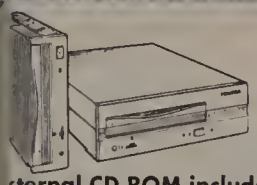
Capacity	Speed	Brand	Cache	Feature	Internal	External
1.3Gig	32ms	NEC	1MB	MultiFunction	$2439	$2499
1.3Gig	19ms	Maxotix Tahiti III-4	4MB	MultiFunction	N/A	$2799

Includes formatting software, 1 disk, and cables. 128MB Fujitsu, 650MB & 1.3Gig HP models also in stock.

SyQuest **INCREDIBLE SALE!**

Complete External Subsystem Includes:
- Syquest drive in an external enclosure.
- 2 year warranty an drive & case.
- 1 Cartridge (1 year warranty)
- 2 SCSI cables (25 ta 50 & 50 ta 50)
- External plug in SCSI terminatar.
- Anubis (by Charismac) formatting saftware

105MB $369 270MB $579



CD ROM DRIVE SALE!

External CD ROM includes: External drive with external RCA jacks. SuperSpat driver with misic play, terminator, and cable.

TOSHIBA 3401, 200ms, Dauble Speed	$409
NEC CDR510, 195ms, Triple Speed	$499
NEC CDR900, 180ms, Quad Speed	$1029

1 GIG DRIVE SHOOTOUT!

MacBechtest software used an IIci. PSR=Peak Sustained Read, PSW=Peak Sustained Write, RT = Read Transactians/sec, WT=Write Transactians/sec, OI = Overall Index

Quantum Empire 1080S 1029MB
PSR=2823, PSW=2555, RT=581, RW=617, OI=5.7

Conner CFP1060S 1013MB
PSR=2778, PSW=2509, RT=775, WT=94, OI=5.6

Seagate ST11200N 1006MB
PSR=793, PSW=793, RT=538, WT=93 OI=4.8

Micropolis MC4110 1002MB
PSR=2561, PSW=2305, RT=332, WT=93, OI=4.7

Fujitsu M2694ESA 1033MB
PSR=798, PSW=834, RT=549, WT=93, OI=4.7

MICROPOLIS **NEW PRODUCT!**

Hard Drives specifically designed far enhanced digital video and audia performance in applicatians such as multimedia, desktap publishing, and video editing.

Capacity	Madel	Internal	External
2000MB	MC2210AV	$919	$999
2700MB	MC2217AV	$1229	$1269
2000MB	MC1936AV	$2199	$2299

MEGA HAUS HARD DRIVES

1-800-786-1184
M-F 8-7 Sat 9-3 Central
Local (713)333-1910
Fax (713)333-3024
No International orders accepted.

CODE MW61

MasterCard DISCOVER VISA AMERICAN EXPRESS

1110 NASA Rd. 1 #306
Houston, Texas 77058

Prices and specifications subject to change. All trademarks are registered trademarks of their respective companies. Returns must be in new condition, and may be subject to restocking fee. Shipping is not refundable.

Circle 245 on the reader service card

MacWAREHOUSE

SPECTACULAR SUPER SAVERS!

ASD Security Trio



Take FileGuard, TrashGuard & FileDuo together and save!
Publisher: ASD Software
UTI 0423
$149.95

Also available:
FileGuard 2.7-*"It's sleek, fast and safe. I highly recommend it." MacUser.* Protect your hard drive, applications, files, and folders (including System Folder) from erasure, unauthorized access, deletion, and illegal copying.
UTI 0135 ★★★★★ **$139**

TrashGuard-Delete files forever, with TrashGuard. Using the Trash Can to delete a file only makes the space available, but does not erase data. TrashGuard not only deletes files, it actually removes them from your hard disk.
UTI 0322 **$49**

FileDuo-Backup your important files quickly and automatically! FileDuo creates backups any time you want: every 5 minutes, at a specific time, or when you shut down your Mac.
UTI 0323 **$89** ★★★★½

MiniCad 5

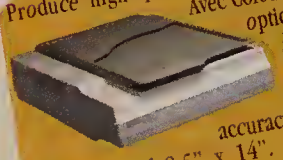


The multi-award-winning price/performance leader for Mac CAD contains 2D, 3D, a database/spreadsheet and a macro language. Includes **FREE** integrated modules for: Architects, Mechanical Enginers, Designers. Customizable menus and palettes, a ClarisCAD conversion kit, and more. Your practical, precision CAD solution!
CAD 0048 $569

Blueprint 4*

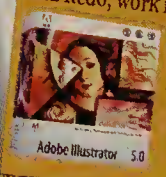
Drafting and design is now easy for architects, engineers and illustrators! The new version 4 incorporates all the professional 2D features found in MiniCad. The price/performance ratio is absolutely unbeatable. Try it on a Manufacturer's 30 day money-back guarantee!
CAD 0024 *Publisher:* Graphsoft
$199.95*

Avec Colour 2400



Produce high quality, dust free scans! The Avec Colour 2400, with an optical resolution of 300 x 600 dpi, provides three pass scanning accuracy with maximum scan area of 8.5" x 14". Includes **FREE** Photoshop L.E. for image editing and OCR software for scanning text.
Manufacturer: Relisys
INP 0356 **$599**

Adobe Illustrator 5.0 -with FREE Streamline!



Illustrator 5.0 offers more flexibility, more powerful tools, and a friendly new user environment. Create dazzling gradients, unlimited layers with write protect options, unlimited levels of Undo and Redo, work in the Preview mode and more...
Order today and get Streamline 3.0 FREE!
Publisher: Adobe GRA 0657
While supplies last.
$389
FREE upgrade to Illustrator 5.5–Call for details.

Images with Impact CD-ROM



Add impact to your publishing and design projects with high-quality, versatile illustrations on one dual format disc. Over 1700 images (4000 when ungrouped) include: Places & Faces, Accents & Borders, People, Graphics & Symbols, Business and much more... *Publisher:* 3G Graphics
GRA 0397 **$279.95**

QuarkXPress 3.3

Unequaled design flexibility and more color & graphics support than before make QuarkXPress the page-layout application favored by publishers. Create innovative, design-intensive publications! You can create variable-shaped text boxes, undo multiple-item, and much much more!
Publisher: Quark
DTP 0110
$589

Newton MessagePad 110



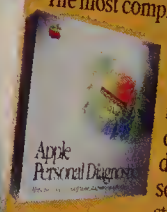
The incredible new technology you've been waiting for is here! Apple's Newton MessagePad is a communications assistant that helps you stay in touch with the world, organize your life, and keep track of your ideas. Because it is designed to know how you work, it actually acts as your assistant.
Manufacturer: Apple Computer, Inc
PDA 0029 **$599**

G-Vox Bundle



Get your guitar and computer on speaking terms! The G-VOX Bundle includes: Pickup & Belt Pack-take the sound of your guitar strings and convert them into electronic signals, Software Riffs-lets you see and interact with notes displayed on your screen & Adrian Legg-an excellent music library
Manufacturer: Lyrrus
MUS 0169 **$399.95**

Apple Personal Diagnostics

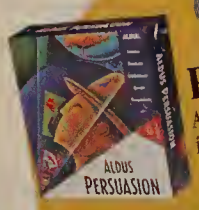


The most complete and easy-to-use diagnostic software for your Mac. Keep your Mac trouble-free by checking and reporting on the well-being of your computer's logic board, disk drives, display and system software. Diagnostics constantly monitor your computer and alert you **BEFORE** problems arise.
Publisher:
Apple Computer, Inc
UTI 0514 **$99.95**

Apple Remote Access Personal Server

Everything you need for both the calling and answering Macintosh in one package and it requires no special equipment. Take advantage of remote access to a single Mac or an AppleTalk network. Features built-in data compression and error detection and supports a range of network types.
Manufacturer: Apple Computer, Inc. COM 0211
$189

Aldus Persuasion 3.0



Aldus Persuasion makes it incredibly quick and easy to create winning slide shows and on-screen presentations. New features include: Powerful charting, State-of-the-art OLE capabilities, On-screen presentations, new & easy interfaces, precision controls and more... *Publisher:* Aldus BUS 0365
$325.95

Retrospect Remote 2.0

Powerful Mac network backup software for centralized backup and archiving. Create scripts with multiple sources, destinations, and file-selection criteria with ease. Then schedule the scripts so your backups run automatically on any day and at any time. Supports compression, encryption and verification.
Publisher: Dantz Development
UTI 0196 **$259**

Mac Handwriter



The power of pen computing is now available to users at all levels of experience. Point, write, draw. It's as simple as using a pen and paper-allowing you to maximixe your comfort and creativity. And our Handwriter Recognition System is unbeatable!
Manufacturer: Communications Intelligence Corporation
INP 0357 **$299.95**

14" Color Display



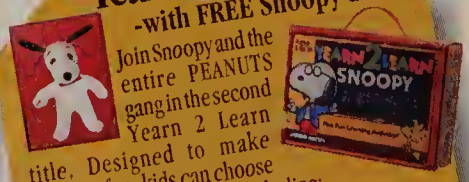
View up to 256 colors, selected from over 16 million, on this 14" screen. 640 x 480 resolution, with super fine 0.29 mm dot trio design, provides legible, flicker-free images. Brightness and contrast controls are easily accessible and a tilt/swivel base provides maximum convenience.
Manufacturer: Magnavox
MON 0051 **$299**

MicroPhone Pro 2.0



MicroPhone Pro 2.0: complete communications for the Mac. Internet Mail and News, MacSLIP, Telnet and MacTCP. Multiple concurrent sessions. Intelligent scripting capabilities for graphical communications. Wyse 50, PowerDriver. Fax. *MacWeek: "For standard [dial-up] telecommunications..., MicroPhone has no peer..." Publisher:* Software Ventures
COM 0209 **$149.95**
While supplies last.
Offer expires 6/30/94.

Yearn 2 Learn -with FREE Snoopy doll



Join Snoopy and the entire PEANUTS gang in the second Yearn 2 Learn title. Designed to make learning fun, kids can choose from different activities including: Interactive Comics, math games, word games, an art studio, and more...
Publisher: Image Smith
BND 0268 **$39.95**

WindoWatch

WindoWatch 1.5.5 tracks window usage on stand-alone or networked Macs—perfect for Desktop Publishers or any business that bills clients for computer time! The program keeps track of every minute spent in any program, and records this information in the form of a timesheet. It can even differentiate between actual use and paused time, which is handy when you're working on several jobs at once.
Publisher:
ASD Software
UTI 0264 **$89**

DesignCAD 2D/3D

DesignCAD is a professional computer-aided design and drafting package that provides complete 2D drafting and 3D modeling in one package! It's designed for architecture, engineering, animation, desktop publishing, and multimedia. DesignCAD is easy to use and comes complete with all the precision tools you need for professional results.
Publisher: American Small Business
CAD 0043 **$155**

1-800-255-6227

Overnight Delivery-Only $3.00

Power User Double Speed CD-ROM DRIVE Only $199

For a Limited Time...

Your Choice Only $9.95 *

Order your Power User CD-ROM Drive now for only $199 and, for only $9.95 more, we'll include your choice of any ONE of these popular chart-topping CDs: *The BodyGuard* soundtrack with Whitney Houston; Billy Joel's *River of Dreams;* Sting's *Ten Summoner's Tales*; or *Music Box* by Mariah Carey!

HURRY, quantities are limited!





Plays your music CDs, too!

Power User Double Speed CD-ROM Drive
Ask for item# BND 0316 ..... **$199**
**PLUS*, for only $9.95, choose ONE of the following music CDs (limit 1 per customer):*
- ❑ Item# AAP 0002 *Whitney Houston-The Bodyguard*
- ❑ Item# AAP 0003 *Billy Joel-River of Dreams*
- ❑ Item# AAP 0004 *Sting-Ten Summoner's Tales*
- ❑ Item# AAP 0005 *Mariah Carey-Music Box*

The New Grolier Multimedia Encyclopedia *PLUS* The Animals! FREE and Atlas Pack FREE! **Ask for item# BBD 0007** **$99***
Total Suggested Retail: ~~$583.95~~
** When you order the Power User CD-ROM Drive at the same time.*

Get the entire 21-volume Grolier Encyclopedia on ONE CD-ROM!

PLUS... for only $99! *



Buy now and also get 2 BONUS CD-ROMs FREE!

THE Mac SUPERSTORE

BUSINESS & PRESENTATION

A LASTING IMPRESSION
ResumExpert (Full line available) ..... ea. 59.
ALDUS
BUS0298 DateBook Pro ..... 49.
DAT0104 TouchBASE Pro ..... 49.
CLARIS
DAT0112 FileMaker Pro. 2.1 ..... 269.
INTUIT
FIN0201 Quicken 4.0 ..... 44.95
LOTUS DEVELOPMENT CORPORATION
BUS0188 Lotus 1-2-3 for Macintosh 1.1 ..... 299.
MICROSOFT
BUS0223 Excel 4.0 ..... 295.
BUS0181 Project 3.0 ..... 445.
BUS0285 Office 3.0 ..... 475.
BUS0269 PowerPoint 3.0 ..... 295.
WRD0059 Word 5.1 ..... 295.
BESTIWARE
FIN0212 M.Y.O.B. 4.0 w/o Payroll 59.95
FIN0213 M.Y.O.B. 4.0 w/ Payroll 109.95
WORDPERFECT CORPORATION
WRD0068 WordPerfect 3.0 w/FREE Grammatik ... 299.95

COMMUNICATIONS & NETWORKING

ADOBE
COM0171 Adobe Acrobat Starter Kit ..... 669.
APPLE COMPUTER, INC.
NET0250 AppleShare 3.0.1 ..... 969.
COM0211 Apple Remote Access Pers. Server .... 189.
COM0126 Macintosh PC Exchange 59.95
DAYNA COMMUNICATIONS, INC.
NET0358 EtherPrint-3 Plus ..... 449.
FARALLON™ COMPUTING
NET0007 PhoneNET® Plus, SE & II 29.95
GLOBAL VILLAGE (FULL LINE AVAILABLE)
PowerPorts ..... Call.
HAYES
MOD0130 ACCURA 144+Fax 144 ..... 239.95
MOD0129 ACCURA 96+Fax96 ..... 209.95
INSIGNIA (FULL LINE AVAILABLE)
UTI0433 AccessPC 3.0 ..... 89.95
POWERUSER®
MOD0116 14.4 Send/Receive Fax Modem 189.95
SHIVA
NET0246 LANRover/L ..... 599.
ZOOM TELEPHONICS
MOD0109 VFX V.32bis MacPack 169.95

EDUCATIONAL & ENTERTAINMENT

BRODERBUND
GRA0268 Kid Pix 1.2 ..... 35.
NORDIC SOFTWARE
EDU0051 MacKids Turbo Math Facts 2.0 ..... 25.
PERSONAL TRAINING SYS.(FULL LINE AVAILABLE)
Excel 4.0, Word 5.1, Filemaker Pro 2.0 ..... ea. 49.
THE SOFTWARE TOOLWORKS
BND0169 Miracle Piano Bundle ..... 269.

GRAPHICS & DESIGN

ADOBE SYSTEMS, INC. (FULL LINE AVAILABLE)
GRA0657 Illustrator 5.0 w/ FREE Streamline ..... 389.
GRA0430 Photoshop 2.5.1 ..... 559.
ALDUS
GRA0654 FreeHand 4.0 ..... 389.95
BND0319 SuperPaint SUPER BUNDLE ..... 99.
DTP0088 PageMaker 5.0 ..... 579.
UPG0032 PageMaker 5.0 Upgrade ..... 149.
APPLE COMPUTER, INC.
GRA0347 QuickTime Starter Kit ..... 109.
CLARIS
GRA0350 MacDraw Pro 1.5 ..... 269.95
ELECTRONICS FOR IMAGING (EFI)
GRA0432 Cachet ..... 299.
QUARK, INC.
DTP0110 XPress 3.3 ..... 589.
SOFTKEY SOFTWARE
FON0480 KeyFonts ..... 49.

INPUT & OUTPUT

CAERE
INP0289 OmniScan ..... 399.
KENSINGTON
INP0231 Turbo Mouse (SE or II) 4.0 ..... 109.
MICROTEK (FULL LINE AVAILABLE)
INP0246 Microtek ScanMaker II ..... 699.
MOUSE SYSTEMS
INP0132 Little Mouse ADB ..... 74.
SUPERMAC
MON0053 SuperMatch 20+ Color Display ..... 1799.

POWERBOOK PRODUCTS

BATTERY TECHNOLOGY INC.
ACC0840 Battery for Powerbook 59.95
KENSINGTON
INP0221 Notebook Keypad ..... 79.
SOPHISTICATED CIRCUITS
INP0232 Powerpad 69.95

UPGRADES & DRIVES

DAYSTAR DIGITAL
DRI0469 Universal PowerCache 33 MHz 299.95
DRI0806 20 MHz Turbo 040i Accelerator 629.95
PERIPHERAL LAND, INC.
DRI0615 Infinity 88/RW44 ..... 559.95
POWERUSER®
CHP0011 4 Meg SIMMs 80ns ..... Call.
CHP0013 1 Meg SIMMs 100ns ..... Call.
BND0176 44/88C MB SyQuest Removable 429.95
BND0094 44MB SyQuest Removable 279.95

UTILITIES & PROGRAMMING

ALADDIN SYSTEMS
UTI0302 StuffIt Deluxe 3.0 ..... 69.
APPLE COMPUTER, INC.
SYS0004X System 7.1 Personal Upgrade Kit ... 59.95
SYS0010 At Ease 2.0 ..... 45.95
CAERE
UTI0293 OmniPage Direct 99.95
MICROMAT COMPUTER SYSTEMS
UTI0285 MacEKG 2.0 ..... 89.
SYMANTEC CORPORATION
UTI0151 Norton Utilities for the Mac 2.0 ..... 95.
UTI0334 Symantec Antivirus 3.5 (SAM) 65.95

I'm Kerry, call me at:

1-800-255-6227

(1-800-ALL-MACS)

Call 24 hours a day, 7 days a week.

Inquiries: 908-367-0440 FAX Your Order to: 908-905-9279
Compuserve Code: GOMW
NEW! Express Customer Service Number:
1-800-925-6227



MacWAREHOUSE®
1720 Oak Street, P.O. Box 3031, Lakewood, NJ 08701
©1994 Micro Warehouse Inc.

- All major credit cards accepted. No surcharge.
- Your credit card will not be charged until your order is shipped.
- If we ship a partial order, we pay the freight on the remaining portion.
- All U.S. shipments are insured at no extra charge.
- C.O.D. orders accepted (add $6.00 including shipping)-$1,000 maximum.
- All products are covered by a 120-day limited warranty. Defective software replaced immediately. Hardware replaced or repaired at our discretion.
- Some products may have system requirements. Call for details.
- **Sales tax:** CT residents add 6%, NJ residents add 7%, Ohio residents add appropriate tax.

SHIPPING

- All orders add $3.00 per order. We ship Airborne Express overnight unless UPS Ground delivers overnight. (Some rural areas require an extra day.)
- Orders placed by 12:00 MIDNIGHT (EST) (weekdays) for "in-stock" items ship same day (barring system failure, etc.) for overnight delivery.
- C.O.D. orders ship via UPS (Blue Label if you are more than 2 days from us via UPS Ground). Charge is $6.00 including shipping.
- Alaska, Hawaii, outside continental U.S., APO/FPO call 908-367-0440 for information. Some products are not available outside the U.S.



- We regret that we cannot be responsible for typographical errors.
- For faster service for existing customers, our computers recognize incoming calls by the telephone number and instantly locate your records.

Copyright 1994 MicroWarehouse Inc. MacWAREHOUSE® is a division of MicroWarehouse, Inc. MacWAREHOUSE® and MicroWarehouse® are registered servicemarks of MicroWarehouse Inc. Item availability and price subject to change without notice. Apple, the Apple logo, Mac and Macintosh are registered trademarks of Apple Computer Inc.

Circle 150 on reader service card

FREE CATALOG SUBSCRIPTION **MW0694**
Check the appropriate box(es) to receive your FREE 1-year subscription and mail this coupon to:
1720 Oak Street, P.O. Box 3031, Lakewood, NJ 08701

Name _____

Address _____ Apt. _____

City _____ State _____ Zip _____

(Expect to receive your first issue within 4-6 weeks).

❑ MacWAREHOUSE® ❑ Data Comm WAREHOUSE™
❑ MicroWAREHOUSE® ❑ CD ROM WAREHOUSE™

DAYSTAR DIGITAL

SPECIAL OFFER →

POWER PRO 601

UPGRADE TO THE POWER OF POWERPC

66MHz $1499
80MHz $1999

POWER

QUANTUM

POWERSTOR 3.5" HARD DRIVES

	Int	Ext
170MB LPS	$179	$229
270MB LPS	$239	$289
340MB LPS	$279	$329
540MB LPS	$449	$449
1080MB Empire	$769	$819
1800MB Pro Drive	$969	$1019

POWERSTOR 2.5" HARD DRIVES

170MB GDGLS	$249	$349
256MB GDGLS	$349	$449

Includes FWB Personal Tool Kit

TOSHIBA

POWERCD-ROM DRIVE

Dual Speed External	$499

EPSON

POWERMO 3.5" OPTICAL DRIVE

128MB External w/cart	$799
128MB Cartridge	$49

Includes FWB Personal Tool Kit

SYQUEST

POWERSYQUEST 5.25" DRIVES

44/88cMB Ext w/cart	$499
44MB Cartridge	$65
88MB Cartridge	$99

3.5" REMOVABLE DRIVES

105MB External w/cart	$499
105MB Cartridge	$59

WANG

270MB External w/cart	$699
270MB Cartridge	$95

Includes FWB Personal Tool Kit

POWERDAT 3.5" DAT DRIVE

16gig External w/tape	$1299
120 meter DAT Tape	$35

Includes Retrospect by Dantz

DAYSTAR DIGITAL

POWER PC ACCELERATORS
with Apple Licensed PowerPC ROMs

66MHz PowerPro 601	$1539
80MHz PowerPro 601	$2039
FastCache PowerPro	$499

TURBO 040 ACCELERATORS

33MHz Value 040 wFC	$799
33MHz Turbo 040 wFC	$799
40MHz Value 040 wFC	$969
40MHz Turbo 040 wFC	$969

TURBO 040I ACCELERATORS

33MHz Value 040i wFC	$629
33MHz Turbo 040i wFC	$629
Image 040	$1559
Quad 040	$859

SUPERMAC™

COLOR DISPLAYS

SuperMatch Hi-Res 20 Trin	$2739
SuperMatch 20•T XL	$2109
SuperMatch 20 Plus Color	$1669
SuperMatch 17•T	$1069

GRAPHICS CARDS

Thunder/24 V2.0	$1717
Spectrum/24 Series IV	$815
Spectrum Power•1152	$1199
Thunder II Upgrade	$515
Spectrum/8•24 PDQ NuBua	$515

DIGITAL-VIDEO SYSTEMS

Digital Film	$3259

E-MACHINES.

COLOR DISPLAYS

T16 II	$1199
T20 MultiMode	$2489

GRAPHICS CARDS

Futura II SX	$429
Futura II LX	$769
Ultura LX	$1115
Simply TV	$379

PORTABLE

PowerLink Presentor	$429
EtherDoc	$599

RADIUS

COLOR DISPLAYS

Intellicolor 20	$1975
Precision Color Pivot	$859
Full Page Display	$1289

CARDS

Photo Booster	$779
SCSI 2 Booster	$239
PrecisionColor Pro 24x	$1399
PrecisionColor 24x	$939
PrecisionColor 24xk	$789
PrecisionColor Pro 24xp	$469
Video Vision Basic	$1569
Video Vision Studio	$3499

SONY

COLOR DISPLAYS

17" CPD1730	$1089
17" CPD17SE1	$1239

GLOBAL VILLAGE

DESKTOP MODEMS

TelePort Mercury	$329
TelePort Gold	$279
TelePort Silver	$259
TelePort Bronze II	$99

POWERBOOK INT. MODEMS

PowerPort Mercury	$329
PowerPort Gold	$279
PowerPort Silver	$259

SUPRA

SupraFax 28.8v42bis	$319
SupraFax 14.4v32bis	$219
SupraFax 14.4LC or 14.4PB	$155

Farallon

ETHERWAVE

AUI/AAUI Transceivers	$109
PowerBook Adapters	$329
NuBus Cards	$199

Apple

POWER MACINTOSH

8100/80AV 16/500 wCD	$5535
8100/80 8/250	$4155
7100/66AV8/250 wCD	$3175
7100/66 8/250	$2899
6100/60AV 8/250 wCD	$2289
6100/60 8/160	$1819

QUADRAS

840AV 16/1000 wCD	$4899
840AV 8/230 wCD	$3419
650 8/230 wCD	$2475

DISPLAYS

Apple Multiple Scan 20"	$2119
Macintosh 16" Color	$1019
Apple AudioVision 14"AV	$639

KEYBOARDS / CD-ROMS

Apple Keyboard II	$99
Apple Extended Keyboard II	$159
Apple CD 300e	$419

MEMORY

8 BIT SIMMS

2MB 80ns	$75
4MB 80ns	$146
8MB 70ns	$325
8MB Q700 70ns	$319
16MB 70ns	$599
16MB Q700 70ns	$619

32 BIT SIMMS

4MB 60ns/80ns	$161/$153
8MB 60ns/80ns	$319/$309
16MB 60ns/80ns	$669/$609
32MB 60ns/80ns	$1272/$1255

VIDEO SIMMS

256k/512k 80ns	$22/$35

POWERBOOK SIMMS

PowerBk140/145/145B/170 4/6MB	$189/$259
PowerBk 165c/180c 6/8/10MB	$235/$309/$380
PowerBk 160/165/180 6/8/10MB	$236/$307/$381
PowerBk 210/230/250/270C 4/8/14MB	$163/$309/$599
18/20MB	$684/$1467

SIMM Prices Fluctuate daily. Please call for current pricing.

We accept Visa, MasterCard, American Express, Discover, Cashiers Checks and Money Orders. Florida Residents must add 6% sales tax.

VISA · AMERICAN EXPRESS · DISCOVER · FEDERAL EXPRESS

POWERCITY

Giving *you* the Power

Mon-Fri 9am-7pm & Sat 10am-4pm EST

800-3-POWER-2

Orders: 800-376-9372
Fax: 305-420-0282
International: 305-420-0369

PowerCity Corporation, 792 S Military Trail, Deerfield Beach, FL 33442 © 1994 PowerCity Corporation. All rights reserved. All PowerCity products are trademarks of PowerCity Corporation. All prices items are subject to change and availability. All Products names of their respective holders. PowerCity and the PowerCity logo are registered trademarks of PowerCity corporation.

Circle 200 on reader service card

ProDirect

Professional Service... Products Direct

- MOST ORDERS SHIPPED SAME DAY.
- NO SURCHARGE ON CREDIT CARDS.
- NO OUT OF STATE SALES TAX COLLECTED
- 30 DAY MONEY BACK GUARANTEE ON ALL DRIVE PRODUCTS.

Quantum — Best Byte for MACs!

ELS Series

Capacity	Seek	Int.	Ext.
127 MB	17ms	180	240
170 MB	17ms	185	245

3.5" LOW PROFILE, LOW POWER DRIVES

LPS Series

Capacity	Seek	Int.	Ext.
240 MB	10ms	245	305
270 MB	10ms	CALL	CALL
340 MB	10ms	295	355
540 MB	10ms	465	525

LPS and ELS series include a 2 year warranty.
GO drives include a 1 year warranty.

GO Drive Series

Capacity	Seek	Int.	Ext.
42 MB	17ms	99	155
127 MB	17ms	230	315
170 MB	17ms	255	335
256 MB	17ms	345	425

Empire and Pro Series

Capacity	Seek	Int.	Ext.
540 MB	10ms	545	605
1080 MB	10ms	835	895
1225 MB	10ms	965	1025
1800 MB	10ms	1085	1145

Includes 5 year factory warranty

FUJITSU — Extremely Fast!

Capacity	Model	Int.	Ext.
240 MB	M2637 2.5" 14 MS, 1 Yr. War. SCSI-2	365	465
330 MB	M2622 3.5" 9 MS, 5 Yr. War. Fast SCSI-2	345	405
520 MB	M2624 F/A 3.5 "9 MS, 5 Yr. War. Fast SCSI-2	565	625
1.2 GB	M2694 ESA 8.5MS, 5 Yr. War. Fast SCSI-2	825	885
2.4 GB	New Price 5.25 "11 MS, 5 Yr. War. Fast SCSI-2	1385	1485

Dyna MO 128 — 128 MB — Dyna MO 30 MS, 3600 RPM SCSI-2 — $865

MICROPOLIS — Music & Multi Media Apps. Novell Certified

Capacity	Model		Specifications	Int.	Ext.
1.2 GB	M4110 Law Profile	3.5"	8 MS, 5400 RPM FAST SCSI-2	850	910
1.2 GB	M2210	3.5"	10 MS, 5400 RPM FAST SCSI-2	850	910
1.7 GB	M2217	3.5"	10 MS, 5400 RPM FAST SCSI-2	1165	1225
2.4 GB	M1926	5.25"	11 MS, 5 yr. War. Fast SCSI-2	1420	1520
3.6 GB	M1936	5.25"	11 MS, 5 yr. War. Fast SCSI-2	2135	2195
	Direct to Disk Recording AV Drives				
1.2 GB	M2210AV	3.5"	10 MS, 5400 RPM FAST SCSI-2	915	975
1.7 GB	M2217AV	3.5"	10 MS, 5400 RPM FAST SCSI-2	1215	1285
3.6 GB	M1936AV	5.25"	11MS, 5yr. War. Fast SCSI-2	2185	2285

COMPARE AND SAVE!
M 2217 1.7 GB $1165
Only 68¢ per MB FORMATTED CAPACITY

- Less than 10ms seek time
- Transfers up to 10mb/sec.
- Fast SCSI-2
- 5 Year (HOT SWAP) Warranty
- 300,000 Hours MTBF
  * Mean time between failure is the average life expectancy of the drive.
- COMES WITH QUADRA AV DRIVER

All drives come formatted and packaged with the latest SCSI Manager 4.3 compatible driver software. External drives come with a double shielded system cable and external termination.

Disk Arrays

PDI 2 GB Array — $3880
Sustoined Transfer Rate up to 6.5MB/second, RAID Level 0 Support
Mechonism: 2 - ST312000

PDI 3.2 GB Array — $4480
Sustained Transfer Rate up to 8MB/second, RAID Level 0 Support
Mechanism: 2 - ST 11950N Barracuda I Drives

PDI 4.2 GB Array — $5540
Sustained Tronsfer Rate up to 9MB/second, RAID Level 0 Support
Mechonism: 2 - ST12550N Barracuda II Drives

PDI Disk Arrays includes **TWO** SCSI-2 Accelerotor cards ond Striping Softwore from Atto Technologies All Disk Arrays hove a 5 yeor warranty.

HEWLETT PACKARD

Capacity	Model		Int.	Ext.
1.2 GB	C2247	3.5"	$995	$1055
2.4 GB	C2490	3.5"	1995	2055
2.35 GB	C3010	5.25"	1975	2075
Optical Drives				
1.3 GB MO	C1716T	23.5ms	2599	2699

QMS PRINTERS

Model	Price
PS 410 4PPM,300DPI	$1399
2 MB, Hat Parts, PS L1 & HP-PCL, 45 Fants	
***PS 860 8PPM, 600 DPI, 11x17**	$3825
12 MB exp. 32 MB,39 Fonts, PS L 1& 2, RISC Pracessar	
***PS 1725 17PPM, 600 DPI, New Price !**	$4399
8 MB Exp. ta 32 MB, PS Level 1 & 2, RISC Processar	
*Netwark interfaces available far Ethernet/Talk,Taken Ring far Netware,TCP/IP, DECnet, Emulatian far DEC LN03, CCiTT Graup IV.	

Seagate

Capacity	Model	Specifications	Int.	Ext.
1.2 GB	ST31200N	3.5" Law Profile 10ms	$875	$935
1.2 GB	ST 11200N	3.5" 10ms	$875	$935
1.9 GB Barracuda	ST 11950N	3.5" 8ms	1535	1595
2.4 GB Barracuda II	ST 12550N	3.5" 8ms	1745	1805
3.4 GB Elite 3	ST 43400N	5.25" 11ms	2145	2245
9 GB Elite 9	ST 410800N	5.25" 11ms	CALL	CALL

All Seagate drives came with a 5 year factory warranty and are backed by a 30 day maney back guarantee. External drives come with a double shielded system cable and external termination.

TAPE BACKUP DRIVES

Capacity			Int.	Ext.
2.0 GB	HP35470A	4mm	$1025	$1045
3-5 GB	HP35480A	4mm	1199	1219
4-10 GB	HP1533A	4mm	1565	1585
20-50 GB	HP1553A & Auta Tape Laader	4mm	3495	3595
2-5 GB	Exabyte 8205	8mm	1599	1625
5-10 GB	Exabyte 8505	8mm	2549	2569
20-50 GB	Exabyte 10i Auta Tape Laader			CALL!

EXTERNAL CABINETS

ZERO FOOTPRINT — $75
40 watt shielded power supply, 110/220 VAC. Warks with all 3.5" and 5.25" HH Drives.

MICROCAB Verticol Stonding — $89
110/220 VAC. Warks with any 3.5" Drive.

FULL HEIGHT — $139
68 watt shielded pawer supply, 110/220 VAC. Warks with all 5.25" Drives.

MULTIPLE BAY CABINETS — $CALL
Twa, Faur, Six, and Eight Bay Cabinets available. CALL FOR QUOTE. All cabinets come with a 25-50 pin Mac system cable. One year warranty on all cabinets.

800-524-9952

Fax 24 Hrs. a Day 612-941-1109

Fax International Orders 612-929-2421 • Call: 612-941-1805
Business Hours: 8:00am to 7:00pm M-F (CST.)

- Dealer Inquires Welcomed
- Volume Discounts Available
- P.O.'s Welcomed - Educational, Government, Corporate
- Please Specify For: Mac, HP Workstation, SUN Sparc or IBM RS6000

ProDirect
6824 Washington Ave. S.
Minneapolis, MN 55344

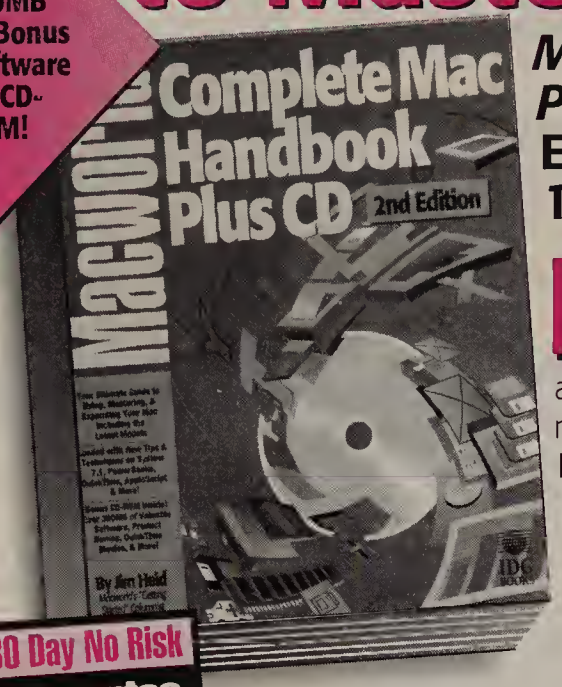
VISA MasterCard

Prices & Specifications subject to change. All trademarks are registered trademarks of their respective companies. Freight not refundable.

Circle 135 on reader service card

The Only Guide You Need to Master the Mac Universe!

Over 300MB of Bonus Software on CD-ROM!



Macworld Complete Mac Handbook Plus CD, 2nd Edition is Loaded with Expert Advice, Product Profiles and 100s of Tips and Techniques

Covers System 7 Pro, Adobe Acrobat, & Apple's New AV Models

Here it is: the 800 page all-in-one handbook for all Mac users – beginners to experts, by Jim Heid, one of *Macworld* magazine's most popular columnists. From word processing and desktop video, to printers and surge suppressors, this completely updated and expanded guide is your key to mastering the Mac universe. Features a Bonus CD-ROM with over 300MB of dazzling software.

"Required reading for the power user – and anyone who wants to be one." – *Frank Casanova, PowerPC Product Manager, Apple Computer, Inc.*

ISBN: 1-56884-033-0
Price: $39.95 USA/$52.95 Canada
800 pages

30 Day No Risk Guarantee

Try this book for 30 days at absolutely no risk. If it doesn't help you get more out of your Mac, return it for a full refund.

IDG BOOKS

IDG Books Worldwide, Inc.
155 Bovet Road, Suite 310,
San Mateo, CA 94402
(800) 762-2974, (415) 312-0600
Fax (415) 358-1260

Order Risk-Free: 1-800-762-2974

For fastest service, fax your order to (415) 358-1260. Phone 8am to 5pm, PT, or complete and mail the order form. Also available wherever computer books are sold.

Yes! Please send me:

	Qty.	Price	Total
Macworld Complete Mac Handbook		$39.95	
UPS shipping & handling add		4.00/Book	
Inquire about Rush delivery at extra charge		Rush	
CA residents add applicable county tax; IN & MA residents add 5% tax, RI residents add 7% tax, TX residents add 8.25% tax, Canadian residents add 7% GST tax.		Tax	
		Total	

I Wish to Pay by:

❑ Check
❑ Visa/MC
❑ Amex
No CODs, U.S. funds only; payment must accompany order.

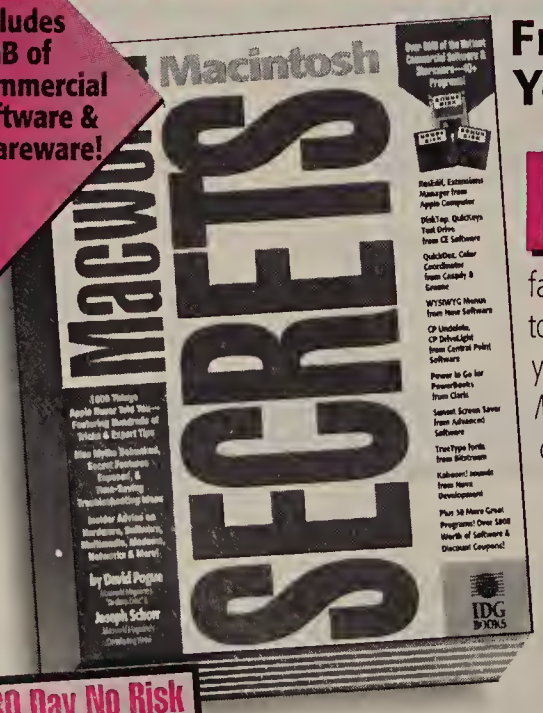
Card No. (include all numbers) Exp. Date
Signature (necessary to be valid)
Name Company
Street City State Zip
Area Code Phone Number

For volume discounts and special orders, please call Tony Real, Special Sales, at 415-312-0644.

MWB84

The Ultimate Mac Reference is Here!

Includes 8MB of Commercial Software & Shareware!



Find Out 1000 Things Apple Never Told You in *Macworld Macintosh SECRETS*™

National Bestseller

Here – complete with over 8MB of software – is the fact-rich book you need to get the most out of your Mac. Written by *Macworld's* own columnists David Pogue and Joseph Schorr, it features 1000 things Apple never told you, including hundreds of tricks and expert tips. With up-to-date coverage on all the latest Mac models, including the new Performas and Quadras. Also includes over 8MB of the hottest commercial software and shareware – over 40+ programs from Apple, Claris, Bitstream, and more!

"*(Macworld) Macintosh SECRETS* appears to be the newly definitive Macintosh reference work, replacing the venerable *'Macintosh Bible'* and Danny Goodman's graphically stunning but somewhat shallow *'Macintosh Handbook'*" – *Washington Post.*

ISBN: 1-56884-025-X
Price: $39.95 USA/$52.95 Canada,
752 pages

30 Day No Risk Guarantee

Try this book for 30 days at absolutely no risk. If it doesn't help you get more out of your Mac, return it for a full refund.

IDG BOOKS

IDG Books Worldwide, Inc.
155 Bovet Road, Suite 310
San Mateo, CA 94402
(800) 762-2974, (415) 312-0600
Fax (415) 358-1260

Order Risk-Free: 1-800-762-2974

For fastest service, fax your order to (415) 358-1260. Phone 8am to 5pm, PT, or complete and mail the order form. Also available wherever computer books are sold.

Yes! Please send me:

	Qty.	Price	Total
Macworld Macintosh SECRETS		$39.95	
UPS shipping & handling add		4.00/Book	
Inquire about Rush delivery at extra charge		Rush	
CA residents add applicable county tax; IN & MA residents add 5% tax, RI residents add 7% tax, TX residents add 8.25% tax, Canadian residents add 7% GST tax.		Tax	
		Total	

I Wish to Pay by:

❑ Check
❑ Visa/MC
❑ Amex
No CODs, U.S. funds only; payment must accompany order.

Card No. (include all numbers) Exp. Date
Signature (necessary to be valid)
Name Company
Street City State Zip
Area Code Phone Number

For volume discounts and special orders, please call Tony Real, Special Sales, at 415-312-0644.

MWB94

Macworld

Subscriber Courtesy Voucher

As a subscriber you are entitled to receive a full year of Macworld for almost 50% less than the annual cover price of $47.40. You save $23.40!

Please Check:

☐ 12 issues/$24. Bill me later.

Name

Company

Address

City, State, Zip

Allow 4 to 6 weeks for delivery. For Mexicon ond Canadian subscriptions, pleose odd $18 per yeor for shipping. Add $70 onnuolly for all other foreign countries.

Savings Statement

Annual Cover Price

$47.40

Regular Subscription Price

$30.00

Your Special Rate

$24.00

4CBL2



NO POSTAGE
NECESSARY
IF MAILED IN THE
UNITED STATES



BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 1167 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

Macworld
SUBSCRIPTION DEPARTMENT
P.O. BOX 51666
BOULDER, CO 80321-1666



DIRECT CONNECTIONS

SHIPPING DRIVES FOR 7 YEARS !!

Fully Compatible Power PC Drives

800-572-4305

30 DAY MONEY-BACK

TECH:612-937-9604 FAX:612-937-6285 HOURS: M-F 8:00-6PM CST

HARD DRIVES

FUJITSU — 5 YEAR WARRANTY

CAPACITY	SIZE	ACCESS	INTERNAL	EXTERNAL
240MB*	2.5"	14MS	$ 375	$ 435
330MB*	3.5"	9MS	$ 315	$ 375
1.2GIG	3.5"	8.5MS	$ 825	$ 885

Seagate — 5 YEAR WARRANTY

CAPACITY	SIZE	ACCESS		EXTERNAL
545MB	3.5"	9MS	Hawk I	$ 685
1.2GIG	3.5"	9MS	ST31200N	$ 899
2.4GIG	3.5"	9MS	ST12400N	$ 1555
2.0GIG	3.5"	8MS	Barracuda 1	$ 1585
2.5GIG	3.5"	8MS	Barracuda 2	$ 1855
2.5GIG	3.5"	8MS	WIDE	CALL
3.4GIG	3.5"	10MS	Elite 3	$ 2195
9.0GIG	5.25"	11MS	Elite 9	$ 4995

CONNER — 5 YEAR WARRANTY

CAPACITY	SIZE	ACCESS	INTERNAL	EXTERNAL
545MB	3.5"	12MS	$ 430	$ 490
1.0GIG	3.5"	9MS	$ 755	$ 815

HITACHI — 5 YEAR WARRANTY

CAPACITY	SIZE	ACCESS	INTERNAL	EXTERNAL
3.7GIG	5.25"	12.8 MS	$ 1845	$ 1945

Anubis Formatting Software included with all hard drives

THE DC DIFFERENCE

More knowledgeable, courteous and reliable. **$4** Million in Inventory. **96%** shipped same day. Not flashy, just the Best!

OPTICAL DRIVES

INCLUDES ONE CARTRIDGE — 1 YEAR WARRANTY

CAPACITY	MODEL	ACCESS	EXTERNAL
128MB	Ricoh	30MS	$ 839
128MB	Fujitsu	30MS	$ 765
650MB	Ricoh Hyperspace	28MS	$ 1799
1.0GIG	Panasonic	90MS	$ 1999
1.3GIG	Sony	40MS	$ 2299
1.3GIG	Tahiti 3	19MS	$ 2799

CD ROMS

1 YEAR WARRANTY

Toshiba 4401			$ 320
Toshiba 3401			$ 439
Sony CDU-561			$ 385
Ricoh Playwright 1000	Recordable CD	Make your own!	$ 3899

TAPE BACKUP SYSTEMS

INCLUDES TAPE + RETROSPECT SOFTWARE — 2 YEAR WARRANTY

CAPACITY	MODEL	MEDIA	INTERNAL	EXTERNAL
250MB	Sankyo CP-150	QC6250	$ 415	$ 475
1.3-2GIG	Archive 4320*	4MM	$ 839	$ 899
1.3-8GIG	Archive Turbo*	4MM	$ 1039	$ 1099
1.3-5GIG	Exabyte 8205	8MM	$ 1539	$ 1599
1.3-10GIG	Exabyte 8505	8MM	$ 2179	$ 2279
4.0-8GIG	Sony 4000	4MM	$ 1089	$ 1149
4.0-8GIG	Sony 5000 DDS-2	4MM	$ 1189	$ 1249

MEDIA

60M	Tape	$ 10	128MB	Optical	$ 35
90M	Tape	$ 12	650MB	Optical	$ 79
112M	Tape	$ 18	1.0GIG	Optical	$ 79
120M	Tape	$ 22	1.3GIG	Optical	$ 105

RAID SYSTEMS



1.0 GIG	RAID	$ 1499
2.0 GIG	RAID	$ 2199
6.0 GIG	RAID	$ 3999

* UP TO 84GIG CUSTOM DESIGNED.
* FAST AND WIDE SCSI II INTERFACE.

DIRECT CONNECTIONS 7668 EXECUTIVE DR. EDEN PRAIRIE, MN 55344.

Circle 121 on reader service card

DIGITAL AXIS INTERNATIONAL



30-DAY Satisfaction Guarantee!

One Year Free On-Site Service!





UMAX Scanners

UMAX 630 OCR -600dpi/TypeReader OCR $649
UMAX 840 -800dpi/PhotaShap 2.5.1 .....$899
UMAX 1260 -1200dpi/PhotoShop 2.5.1 .....$1,195
UMAX 1200SE -1200dpi/PhataShap 2.5.1 ...$2,389
TypeReader OCR Software, with scanner purchase..$99
UMAX Transparency Adapter $449

Kodak ColorEase PS

Color DyeSub Printer/PS level 2 .....$6,589

High Performance Drives

Seagate Hawk 1.08GB/9ms access.....$849
Seagate Hawk 2.4GB/9ms access.....$1,499
2GB DAT Tape Backup $699

NEW Wacom Tablet!

UD1218RM 12x18 tilt w/ calligraphy pen..$739

PowerBook SCSIswitch

Switchable from SCSI to Dock Mode,
Sturdy Metal Shielded Connectors
LED Activity Indicator



$36

FREE with PowerBook Purchase!

DIGITAL AXIS

512-329-7001
800-494-9555
Fax 512-327-0921

THE INTERNATIONAL DEALER SUPPORT NETWORK

Corporate and Government P.O.s accepted, Subject to Approval. Wire Transfer, COD — All Major Credit Cards Accepted. UPS, FedEx, DHL 2-day to Europe • 5000 Plaza On The Lake, STE 250, Austin, TX, USA 78746

Circle 83 on reader service card

PRODUCT INDEX
BUSINESS TOOLS

Macworld SHOPPER®

PRODUCT INDEX

Category — Page No.

ACCESSORIES.....257
- Cases
- Covers
- Diskettes
- Furniture
- Security Systems
- Serial Switches
- Trackballs
- PowerBook

BUSINESS TOOLS.....236-238
- Bar Code
- Credit Authorization
- Point of Sale
- Property Management
- Foreign Language Translation

EDUCATIONAL & RECREATIONAL.....258-259
- Astrology
- Astronomy
- Discount Software
- Flashcards
- Games
- Genealogy
- Grading
- Lottery
- Music
- On-Line Services
- Religion

Category — Page No.

GRAPHICS 261-262
- 3D
- CAD/CAM
- Clip Art
- Fonts
- Graphics Translators

MOBILE COMPUTING & PDA's 256-257
- Battery Charger
- PowerBook Accessories
- Security
- Supplies

MULTIMEDIA & CD-ROM.....260-261
- Presentation

NETWORKING & COMMUNICATIONS 259
- BBS
- Printer Interface

PROGRAMMING & UTILITIES 264
- Languages

SERVICES & SUPPLIES 263-264
- CAD/CAM
- Computer Insurance
- Computer Repair
- Consulting
- Data Recovery
- On-Line Services

Category — Page No.

SERVICES & SUPPLIES (continued)
- Printer Supplies
- Slides

SPECIALIZED MARKETS 262-263
- Languages
- Manufacturing
- Medical
- Real Estate
- Shareware

SYSTEMS & PERIPHERALS.....238-250

UPGRADES & MEMORY 250-256

ACCOUNT MANAGERS: 800.888.8622
- Carol Johnstone 415.978.3152
- Shannon Smith 415.974.7414
- Niki Stranz 415.978.3105

DTP COORDINATOR:
- Clayton Haberman 415.978.3132

No other Macintosh magazine offers you more affordable four-color than Macworld

Bar Code Headquarters

Labeling Software

Now with PostNet

- 65 PostScript Type 1 Bar Code Fonts – As easy to use as Times or Helvetica
- Use in any program with a font menu
- Code 39, UPC/EAN, 128, I 2of5, PostNet
- Not HyperCard Dependent because they're fonts
- Simple, Easy-to-Use, Plug & Play!
- Create 1,000 incremented bar codes in 5 seconds or translate your list using Sequencer™ DA
- Generate film masters in Quark, PageMaker, etc.
- **$199** includes our DA, All Fonts and Manual

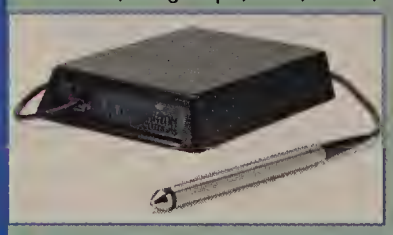
WORTHINGTON DATA SOLUTIONS

Bar Code Readers

New RF Wand

for all Macintosh ADB or Serial

- Attaches thru ADB as 2nd Keyboard in seconds.
- UPC/EAN, Code 128, 2of5, Code 39, Interleaved 2 of 5
- Wand, Magstripe, CCD, Laser, Slot Badge



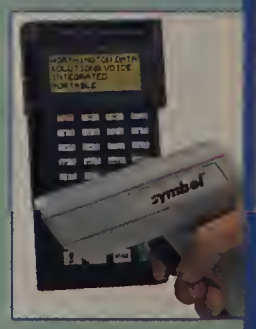
- All European Keyboards Supported
- **Top Rated by Independent Reviews**
- Complete Reader with Cordless RF Wand – **$695**
- Complete Reader with CCD Scanner – **$624**
- Complete Reader with Corded Steel Wand – **$329**

Portable Readers

With Voice Prompts

for all Macintosh ADB or Serial

- 64K or 256K RAM. Keyboard or serial upload.
- Download Tables
- Wand, CCD or Laser Input
- UPC/EAN, 128, 2of5, MSI, Code 39, etc.
- 4 x 20 LCD, 35 Keys
- 2 Built-in Inventory Programs
- Optional Voice prompts and error msgs. You record!
- Double duty as non-portable



- Very easy to program & interface with applications
- Complete 64K Unit with Wand & Voice – **$799**

Ordering is Easy!

Call for Our Catalog

- 30 Day Money Back Guarantee
- Qualified P.O's Accepted
- 2 Year Warranty on Readers
- Same Day Shipping
- Free UPS Blue in US

800-345-4220

or call 408-458-9938 • FAX 408-458-9964

In Europe call our Irish Office at 00 353 1 6614 566

SYNEX

BAR CODE PRO™

"Installs in 60 sec. and takes less than five minutes to master" — MacWorld !

Bar Code Pro™ creates color EPS or PICT graphics for use with Quark™ or PageMaker™ (to name a few) for packaging, coupons, CDs, labeling, libraries, inventory, or publishing. Versions: UPC (A), UPC (E), Code 39, EAN, EAN-128, ISSN, ISBN, POSTNET, FIM, Code 128, Codabar, MSI/Plessey, ITF, Pharmacode

ALL NEW VERSION 2.0

0 012345 7

(800) 447-9639
FAX: (718) 768-3997

INTERNT'L CALL: (718) 499-6293

CIRCLE 450 ON READER SERVICE CARD

Label Press™

Label Printing Software Tamed!



Introducing the most sophisticated, easy-to-use, bar code label printing utility ever. **Label Press** includes hundreds of Avery templates and industry standards such as KMart, JCPenney, UPS, Fed EX and many more. For any Mac compatible printer.

For industrial label printing **Label Press Thermal** Works with all Intermec, Fargo Datamax, and Zebra printers.

SYNEX (800) 447-9639

CIRCLE 545 ON READER SERVICE CARD

BarCode Labeler™ II

for the Macintosh



When you need easy to use, full-featured bar code printing software for the Macintosh, look to BarCode Labeler II. This package allows you to easily create, edit, and print bar codes in all the popular bar code symbologies.

BarCode Labeler II makes merging text or graphics into your bar code simple. Sizing and movement capabilities give you the flexibility to develop what you want in a bar code or label.

Call us today for information on BarCode Labeler II.

Retail price: $149.00

1105 N.E. Circle Blvd., Corvallis, OR 97330
503-758-0521 • Fax 503-752-5285

Videx

Videx is a registered trademark and BarCode Labeler is a trademark of Videx, Inc. GCO466

CIRCLE 503 ON READER SERVICE CARD

BRING HOME AN AWARD WINNER.

WINNER 1993 Discover TECHNOLOGICAL INNOVATION AWARD



With POWER TRANSLATOR® *PROFESSIONAL* from Globalink® you can translate words, sentences, even entire documents into Spanish, French or German to/from English. All at the push of a button.

Specialized Subject Dictionaries are available for technical and professional uses. You can even create your own!

Give your Mac the power to talk global. Get POWER TRANSLATOR *PROFESSIONAL*, your ticket to worldwide communication.

Globalink, Inc.
9302 Lee Highway, Fairfax, VA 22031-1208
Intl.: 1-703-273-5600
Fax: 1-703-273-3866
1-800-767-0035
U.S. and Canada

CIRCLE 544 ON READER SERVICE CARD

The Experts Choice for Barcoding!

Barcode Generation

MacBARCODA

With a color option that works

All the vital features for **safe, high-quality** barcode production. All the popular barcode types. Compatible with all major page-makeup and graphics software. The highest precision barcoding package available for the Mac.

Barcode Readers

Bar code data collection for the Mac or PC.Works with any software package. All major bar codes supported.

Wand Reader **$ 255**

Laser Reader **$ 495**

Label Printing on Sheets

LabelDesigner

Version 2.0 of the easy-to-use, PostScript label printing package. Any label size & sheet layout. Text, barcodes, PICT & EPS graphics incrementing barcodes and numbers, plus many new features. Includes free industry-standard label templates.

Label Printing on Reels

macthermal

The easiest solution for printing short-run multi-variation labels on reels with powerful text, graphics, and barcode facilities. Compatible with the range of Zebra reel fed thermal printers.

Computalabel

Call Toll Free -

800-289-0993

28 Green Street, Newbury MA 01951 Fax 508-462-9198

BUSINESS TOOLS

SYSTEMS & PERIPHERALS

Macworld SHOPPER®

The Recognized Macintosh Bar Code Experts

UniScan-300 ADB Bar Code/Mag Stripe Reader $369
(Industry's only lifetime warranty)
Complete with wand & bar code printing software
Compatible with all Macs from 128K to current models.
Inventors of keyboard interface bar code reader for Macintosh.

PDCS-300 Portable System *(1 year warranty)* $999
Includes wand, communications software, cable, battery & AC adapter.
256K storage (128K RAM & 128K Flash EPROM) upgradeable to 1 meg.
Data collection program included · Inexpensive program generator

30-Day Money-Back-Guarantee on All Products
Established 1978 · Newton Scanners and Software Available Now!
Discounts for Resellers, Schools, Non-Profit & Government Agencies

TPS Electronics
2495 Old Middlefield Way, Mtn. View CA 94043
(415) 988-0141 Fax (415) 988-0289
(800) 526-5920 AppleLink: BARCODE

CIRCLE 441 ON READER SERVICE CARD

Business Tools

Job Tracking — *Made-2-Order™*
Manufacturing — *InQuire/Mac™*
Forecasting NEW!

Inventory
Purchasing
Estimating
Order Entry
Bill of Material
Custom Forms
MRP

• New Hybrid Solutions • Relational Database
• AppleScript Ready • Easy-to-Use Interface

OnBase Technology, Inc.
Interface...Database...OnBase

Call Now for Demo
800-782-5682
714-830-5682 FAX 830-5691

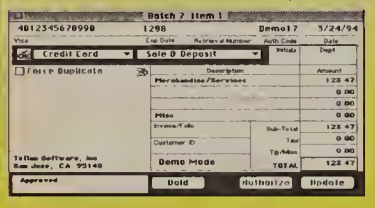
OK

CIRCLE 479 ON READER SERVICE CARD

Cash On Your Screen!

Credit Card Authorization & Electronic Deposit

MacAuthorize™



- Automatically authorizes and deposits all credit card sales—individually or in batches
- Save time and money, eliminate credit terminals
- Certified on all major bank networks
- Handles all credit cards plus check guarantee
- Supports AppleEvents & Import/Export
- Supports card readers & receipt printers
- Instant totals, discount rates, printed reports, etc.
- Database and file searching
- Many more features

POS Credit Developers since 1981

800-4-TELLAN • 408/274-1110 • Tellan Software, Inc.

CIRCLE 480 ON READER SERVICE CARD

Mac–Barcode® Label Pro Version 2.0

Now Featuring UCC/EAN-128 for Compliance Labeling

Not a Font...A True Label Application!

The Best Macintosh® Bar Code Label Software Just Got Better! Design and Generate Bar Code Labels Using U.P.C., EAN, Bookland, and 7 More Symbologies Including UCC/EAN–128 (with AIs). The New York Times Says "Mac–Barcode Is Both Easy to Use and Versatile."

$399.
Call for Product Literature and Demo Disk.
800–733–7592

The Mac–Barcode Co.
FAX 617–934–6233
P.O. Box 1814,
Duxbury, MA 02331

Ask Us About Printers!

CIRCLE 562 ON READER SERVICE CARD

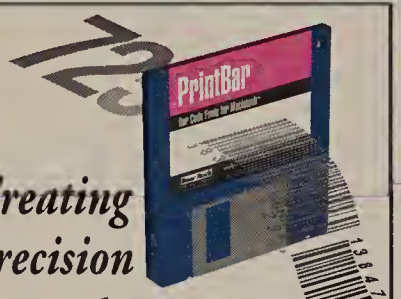
KEEP YOUR DUCKS IN A ROW

WITH
POS/OE 4 MAC™

- CREDIT CARD PROCESSING
- ORDER ENTRY • ACCOUNTING
- POINT-OF-SALE • BARCODE
- TELEMARKETING • INVENTORY
- DEMO VERSION AVAILABLE

EES Companies, Inc.
(800) 508 - 4444
(508) 653-6911 • FAX (508) 650-1872

CIRCLE 600 ON READER SERVICE CARD



Creating precision bar codes is as easy as using a font!

PRINTBAR™
BAR CODE FONTS

- Compatible with virtually any Macintosh application.
- Choose from: • UPC/EAN/ISBN • Code 39 • Interleaved 2 of 5 • POSTNET/FIM.
- 90-day money back guarantee.
- *"This is the best product of its kind, and it's reasonably priced too"* —MacUser review ★★★★½

Bundle discounts available.

Bear Rock TECHNOLOGIES
4140 Mother Lode Dr., Ste. 100, Shingle Springs, CA 95682
916 672-0244 · Facsimile 916 672-1103

Scanning bar codes is even easier!



CODESCAN 3000™
BAR CODE READER

- Comes complete with wand and 5 year warranty.
- Scans information directly into software application.
- Available with laser gun, CCD, badge slot, magstripe options.
- No software required. Ready to use in minutes!
- Money back guarantee.

Call the Bar Code Experts
800 232-7625

CIRCLE 466 ON READER SERVICE CARD



POINT OF SALE
INVENTORY CONTROL

- Retail
- Manufacturing
- Educational
- Service Industry
- Vertical Markets

Bar-Code Readers from $289.00
3" CCD w/Internal Decoder - Only $389.00
Receipt Printers • Cash Drawers
Credit Card Auth. • Port. Data Collection
UPS Manifest SW • Accounting
call or fax for a FREE CATALOG
(800) 622-7670 °
(618) 985-8237 TEL • (618) 985-3014 FAX
Dealer Inquiries Welcome
30 day MBG
P.O.S. DIRECT

CIRCLE 466 ON READER SERVICE CARD

Mac Landlord $399
Upgraded version 2.2 now available. Still the Easiest-to-use property management program for multiple properties & unlimited units. Includes tenant and unit records, recurring income and expense, check writing, checkbook balancing, printing tenant notices, income and expense ledgers, and much more. Free telephone support. Demo for $25, credited to purchase.
Labana Management Company
P.O. Box 2037
Dearborn, MI 48123
313/562-6247

PostScript Laser Printer for Macs and PCs!

Only $595 With Toner



Optional 250 sheet 2nd tray available

75-sheet universal paper tray accepts letter, legal envelopes and more!

Count on The Printer Works for great deals on PostScript printers! Call for our free catalog!

- Fast 32-bit AMD 29000 RISC processor
- MicraSoft TrueImage PastScript interpreler with 35 TrueType fants
- Compatible with both Adabe Type 1 and TrueType fants
- PC and Macintash campatible— it can connect ta both simultaneausly!
- AppleTalk, Centranics Parallel and RS-232 Serial Interfaces
- Compact, reliable 4ppm, 300dpi Canon LX engine
- Includes EP-L 8000-page taner cartridge same as used by HP and Apple
- 1 Year Warranty, 30-Day Money-back Guarantee, Free Technical Support

the PRINTER WORKS
Since 1982

Call Toll-Free
800-225-6116
3481 Arden Road, Hayward, CA 94545

CIRCLE 483 ON READER SERVICE CARD



We Carry New Products Only!

LOWEST PRICED BUNDLES ON HIGH -END GRAPHIC STATIONS

8100AV special
136/2Gig/Press View 21" $16666
CD / Sierra 1.3 Gig OpticalTape

Apple — Power Macs 8100

8MB/250HD 3935	8MB/250HD/CD 4141
16MB/500HD 4444	16MB/500HD/CD 4774
16MB/1GIG/CD . 5115	24/1GIG 5151
40MB/1.8GIG/CD 6262	24/1GIG/CD 5395
(AV)16/500/CD .. 5252	(AV)24/1GIG/CD 5885

16MB/500HD/CD/Color 14"/Ext. Key 5151
40/1GIG/17T/Syquest 88C/Ext Key ... 7272
72/1.8GIG/20"Color/CD/Ext Key 9339
136/2GIG/Multiscan 20"/CD/Ext Key 12721

Apple — Power Macs 7100

8MB/250HD 2727	8MB/250HD/CD 2999
16MB/500HD 3333	16MB/500HD/CD 3585
24MB/500/CD ... 3585	24/1GIG 3936
74MB/1.8GIG 5785	40MB/1GIG/CD . 4774
(AV)8/500/CD 3737	(AV)24/1GIG/CD 4646

24MB/500HD/CD/Color 14"/Ext. Key .. 4040
40/1GIG/17T/Syquest 88C/Ext Key ... 4848
72/1.8GIG/20"Color/CD 7777
(AV)72/1.8GIG/20"Color/CD 8488

Apple — Power Macs 6100

8MB/160HD 1725	8MB/250HD 1889
8MB/250HD/CD 2160	16MB/500HD/CD 2727
24MB/500 2727	24/1GIG 3165
(AV)8/250/CD 2454	(AV)16/500M/CD 3191

8MB/160HD/CD/Mono 14" /Ext. Key . 1899
8MB/250HD/CD/Color Plus/Ext Key .. 2525
16/500MB/CD/SuperMac 17T 3245
(AV)16/500MB/CD/SuperMac 17T 3995

Apple — PowerBooks

PowerBook 145B

4Mb/80Mb 1299	4Mb/80Mb 1666
8Mb/80Mb 1455	8Mb/80Mb 1833
4Mb/160Mb .. 1450	4Mb/160Mb .. 1949

PowerBook 165

	8Mb/160Mb .. 2112
	14Mb/230Mb 2395

PowerBook 180

4Mb/80Mb 2025	
4Mb/120Mb .. 2121	
8Mb/80Mb 2191	
8Mb/120Mb .. 2299	
8Mb/230Mb .. 2349	
14Mb/230Mb 2666	

Duo 250

	4Mb/200Mb .. 1887
	12/200/Mdm . 3467

Duo 270C

	4Mb/240Mb .. 2685
	12/240/Mdm . 3175

MACMARKET
6924 CANBY AVE. UNIT #104
RESEDA, CA. 91335

To Order Call:
1•800•223•4622

Other Inquiries & International Orders:
TEL: 818 · 708 · 6388 FAX: 818 · 708 · 6399

WE install your memory....., internal syquest....., Internal optical....., internal DAT.., and test all components together before shipping your custom configured system.

Quadra 605 SPECIAL
040/25MHz / 8MB/230MB 1599
14" Color Plus / Ext. Kybrd

WE STOCK ALL ADVERTISED ITEMS

Apple

8Mb/230 1895	**Quadra 650**
8Mb/230/CD . 2222	24/500/CD 3125
16Mb/500 2499	24Mb/1Gb 3135
	40Mb/1GB/CD 3995

Apple

8Mb/80 1565	**Quadra 660AV**
8Mb/230 1685	16/500 2295
	16/500/CD 2445

Apple — Monitors

16" Color 975	Multiscan 20 . 1995
Color Plus 295	Color Display . 425

Audiovision 14" Display 575

Apple — Printers

Select 300/Toner .. 755	Select 310/Toner . 799
Select 360/Toner 1499	Pro 810/Toner ... 4650
Pro 630 W/Toner 1999	StyleWriter II 299
Color StyleWriter .. 595	Portable StyleWritr 405

Exabyte — Back-up

5Gig 1495	10Gig 2366

NuDesign/Sony — Back-up

5Gig 999	8Gig 1179

Mitsubishi — Monitors
Diamond Scan FS 15" monitor 509

Sharp — Scanner
610 11x17 / PhotoShop/ Transparancy .. 8999

E-Machines — Monitors & Video

Futura IILX 759	Futura IISX 449
Ultura LX 1055	T16 II ..... Call

Radius — Monitors & Videos

Intellicolor 20 2411	Precision Pivot .. 839
Precision 20V . 1745	Pivot Mono 15" .. 569
Full page 15" .. 469	Two Page 21GS 995
Precision 24x 909	PrecisionPro 24x 1344
Display 17 1195	PhotoBooster 769

Asante — Networks

MINI EN/SC 10BaseT SCSI Ether 237
MINI EN/SC Thin 10BaseT SCSI Ether295
10T Hubs 8/12 Connect MACs,PCs 239/479
10THubs/12Port 10BT/Thk/Thn 465
10THubs/8Port 10BT/Thn 229

Micropolis — Hard drives
3.1GB External 10MB/Sec 2233
1GB Ext. 8ms, Wide SCSI 20MB/Sec 1044

QMS — Color Printers
Hammer Head 3833
Color Script 210 8MB Ram 4222

SuperMac — Monitors & Video

Thunder IIGS 3595	PressView 21" 3295
Thunder II 2995	Hi-Res 20 2549
Thunder 24 .. 1695	20T XL Color 2399
Spec Power.1152 1242	20" Color Plus 1535
Spec. 24 IV 753	SuperMatch 17T ... 999
Spec8/Mono 385/266	Platinum 21 .. 1095

LOWEST PRICES ON ALL MACPRODUCT LINES

PLI — Back-up

Infinity 88/44 .. 488	Infinity Optic 128 .. 999
Infinity 105 429	DAT 10GB ... 1395
Infinity 270 599	600MB Optical 1429

1.3 GB MaxOptical 4MB cache Ext.. . 3249

HP — Printers

Laser 4M 1895	Laser 4MP .. 1395
Laser 4ML 995	Deskjet 1200c 2095

NEC — Monitors & Printers

4FGE 15" 725	6FGP 21" 2395
5FGE 17" 1095	5FGP 17" 1395
3FGE 15" 595	3V 15" 495

Model 640 300dpi, 3MB Ram 799
Model 1097 600dpi, 7MBRam,10ppm 1395

Pinnacle Micro — Back-up

PMO 650MB Optic. 2595	Recordble RCD 202 3295

Sierra 1.3 GB Ext Optical 2649

Microtek — Scanners

Scanmker II 645	Scanmaker II XE .. 969
Scanmker IIG 469	Scanmker IISE 765

Umax — Scanners

630 LE 795	1260 1444
840 965	1200SE 2595
Auto Feeder ... 435	UTA 666

Sony — Monitors

1430 488	17SE 1149

WACOM — Pen Tablets

ARTZ-Z 6X8 289	12X12 UD 495

NewGen (Imager Plus) — Printers

6L/Ethernet 3999	12/Ethernet 6199

Texas Instruments — Printers

MicroWriter PS23 . 695	MicroWriter PS65 . 949

MicroLaser Pro 600, PS 23, 8PPM.. . . 1345
MicroLaser Pro 600, PS 65, 8PPM... 1549

GCC — Printers

WriteMove II 399	BLP Eclips 4PPM . 939
BLP Elite 4PPM ... 777	PLP II 4PPM 565
SelectPress1200 5950	BLP Eclips 8PPM 1295

SelectPress 600/600 Pro 3599/4644

NIKON — Scanners
COOLSCAN (Scanner 35mm Slide).. 1848
COOLSCAN (Internal).. 1590

- We accept COD, and Purchase orders
- Free Shipping in U.S. for all CPU Repairs
- All Returns are subject to restocking fee, must be in original package, condition & needs an RMA#
- Visa, MC & Discover add 2%
- Prices are subject to change without notice

CIRCLE 420 ON READER SERVICE CARD

Powerbook 180c
4/80	$2249
8/80	$2399
4/160	$2449
14/160	$2995
14/300	$3245

Powerbook 180
4/80	$1895
4/120	$2099
8/120	$2349
14/160	$2699
14/240	$2899

Powerbook 165
4/80	$1499
8/80	$1729
4/160	$1699
8/160	$1949
14/160	$2199

Powerbook 145B
4/40	$1099
4/80	$1199

DUO'S
250 4/200	$1799
250 12/200	$2149
270C 4/240	$2899
270C 12/240 W/MDM	$3399
DUO DOCK	$499
DUO DOCK 230HD	$639

Quadra 950
8/0	$2899
8/400	$3000
16/1GIG	$3899
256/2GIG	$14395

Quadra 840AV
8/230	$2699
8/230 W/CD	$2899
16/500	$3299

Quadra 800
8/230	$2199
8/230 W/CD	$2499
8/500	$2499

Quadra 660AV
8/80	$1549
8/230	$1599
8/230 w/CD	$1899
8/500	$1899

Quadra 650
8/230	$1949
8/230 W/CD	$2199
8/500	$2299
8/500 W/CD	$2599
16/1GIG	$3299

Quadra 610
8/160	$1289
8/230	$1599
8/230 W/CD	$1969
8/500	$1899
8/500/CD	$2199

Quadra 605
4/80	$799
8/80	$969
8/160	$1099
8/160/CD	$1399
8/240	$1199
8/240/CD	$1499

MORE MACS
Classic II 4/40	$599
Classic II 4/80	$699
Classic II Color 4/80	$899
LCIII 4/80	$899
MAC II SI 3/40	$599
Centris 610 4/80	$799
Centris 650 8/230	$1499
Cent.650 8/230 CD	$1779

UNIVERSITY, GOVERMENT, AND FORTUNE 1000 P.O.'S, Trained Staff, Out of USA OK!

LA's LEADING COMPUTER STORE!

LA COMPUTER CENTER

(310) 473-2535 FAX (310) 312-9041

Ask about our 4 year on site warranty! Next day shipping!

POWER PC

6100 8/160	$1699	7100 8/250	$2699	8100 8/250/CD	$4099
6100 8/250/CD	$2149	7100 8/250/CD	$2995	8100 16/500/WIN	$4699
6100 16/250/WIN	$2349	7100 16/250/WIN	$3149	8100AV 16/500/CD	$4995
6100AV 8/250/CD	$2449	7100AV 8/500/CD	$3699	8100 16/1GIG/CD	$5495

ALL MODELS IN STOCK NOW. WE WILL BEAT ANY PRICE.

Powerbook DUO 250

- 68030 33MHz
- 6 HR Battery Life
- 4.2 pounds
- 9" Active Matrix



4/80HD $1569
4/200HD $1689
12/200HD $2049

Powerbook DUO DOCK

- 2 NUBUS slots
- Superdrive
- Expandable
- Affordable

$379

RADIUS

Photobooster for Stage II Rocket	$599
Photobooster for Rocket	$599
Photobooster for Rocket	$799
Stage II Rocket	$1499
Stage II Rocket w/ Macromedia	$1795
Rocket 33 Accelerator	$999
RocketShare	$399
SCSI-2 Booster	$269
VideoVision Basic	$1499
VideoVision Presentation	$1749
VideoVision Studio	$3299
PrecisionColor Pro 24x Interface	$1349
PrecisionColor Pro 24xk	$799
PrecisionColor Pro 24xp	$499
PrecisionColor 8xj Interface	$499
Color Pivot Nubus Interface	$499
PrecisionColor 17" Display	$1299
PrecisionColor 20" Display	$1699
IntelliColor 20" Display	$1849
PrecisionColor Pivot	$899
TwoPage 20" Mono / Full Page	$899/$549

FAX MODEMS

Powerport Global Village Bronze 24/96	$149
Powerport Global Village Silver 96/96	$289
Powerport Global Village Gold 14.4/14.4	$329
Powerport Global Village Mercury 19.2/19.2	$399
Teleport Global Village Gold 14.4/14.4	$329
Teleport Global Village Mercury 19.2/19.2	$399
ZOOM external 24/96 FAX/MODEM	$149
ZOOM external 14.4/14.4 FAX/MODEM	$199
US ROBOTICS 24/96 FAX/MODEM EXTERNAL	$189
US ROBOTICS 14.4/14.4 EXTERNAL	$239
APPLE EXPRESS MODEM 96/14.4	$249

KEYBOARDS

APPLE STANDARD KEYBOARD	$99
APPLE EXTENDED KEYBOARD	$149
APPLE ADJUSTABLE KEYBOARD	$169
101 EXTENDED KEYBOARD	$99
KENSINGTON TURBOMOUSE TRACKBALL	$139

SOFTWARE

MICROSOFT WORD / EXCEL / OFFICE	329/329/499
ALDUS PAGE MAKER / FREEHAND	$549/$399
QUARK EXPRESS	$649

APPLE SELECT 310 LASER PRINTER

Postscript, 4ppm, 300dpi.

NOW ONLY $599

MEMORY DEPOT!

POWERBOOK 145,160,165,170,180,180		QUADRA'S QUADRA 605, 610, 650,	
4MB	UPGRADE $179	4MB	UPGRADE $179
8MB	UPGRADE $329	8MB	UPGRADE $299
10MB	UPGRADE $429	16MB	UPGRADE $629

Apple Printers
Select 300 w/Toner	$499
Select 310 w/Toner	$599
Select 320 w/Toner	$899
Select 360 w/Toner	$1439
Pro 630 w/Toner	$1949
Pro 810 w/Toner	$4399
Portable StyleWriter	$399
LaserWriter II F	$899
LaserWriter II G	$1495
Apple Color Printer	$549

Hewlett Packard
DeskWriter 550c	$499
DeskWriter 560c	$569
DeskWriter 310	$339
DeskJet 1200c (PS)	$1999
LaserJet 4ML	$989
LaserJet 4MP	$1349
LaserJet 4M	$1869
Scanjet IIcx	$949
220 Volt Products	CALL

CD-ROM Drives
Apple CD 150 Ext	$159
Apple CD 300 Ext	$389
Apple Power CD	$399
Apple Multimedia CD	$599
NEC 3xI/xe/xp	499/599/659
NEC 4X (4 spin!)	$995

HARD DRIVES
Quantum 80MB	$149
Quantum 230MB	$199
Quantum 500MB	$499
Toshiba 877MB	$589
External Chasis	$99
Apple 2.5" 20MB HD	$49

SYQUEST
44MB Int/Ext	$199/$239
88c Int/Ext	$309/$369
105 Int/Ext	$389/$449

Apple Monitors
14" Basic Color	$199
14" Plus Color	$299
14" RGB	$419
Vivid View 14"	$299
AudioVision 14" w/adt	$699

NEC Monitors
3FGE 15" Color	$599
4FGE 16" Color	$729
5FGE 17" Color	$999
5FGP 17" Color	$1199
6FGP 21" Color	$2199

SONY Monitors
1430 14" Color	$539
1730 17" Color	$989
17SE1 17" Color	$1129
2036 20" Color	$2029
2038 21" Color	$2349

SuperMac
Thunder II 24bit	$2279
Thunder II Lite	$999
Spec 24 PDQ Plus	$995
Spectrum 8	$399
20" HI Res Color	$2599
20" Platinum Color	$899
21" Plat (2pg Mono)	$1039
SuperMatch 20t	$1649
SuperMtch 21 (2pg)	$2399

SCANNERS
Agfa Arcus Plus	$2799
Agfa Transparency	$689
Microtek II	$639
Microtek IIG	$459
ScanMaker IIXE	$959
ScanMaker IISP	$779
UMAX 600le	$689
UMAX UC 840	$995
UMAX 1260	$1499
UMAX 1200se	$2639

We beat prices! We carry only new products. Let us custom configure your system! We accept VISA, MasterCard, and AMEX.

All prices cash discounted. Prices subject to change without notice. Not responsbole for typographical errors.



Keep the Flame Alive

The lamp of freedom and the light of learning can take many forms.

Your company's used computers, laser printers, modems, and other surplus equipment can help empower young minds in America, and advance the development of emerging democracies around the world.

The East West Foundation takes your surplus or used equipment and distributes it to American schools and charities and to democratic and educational institutions in Eastern Europe, Africa, Asia, the Commonwealth of Independent States, and Latin America—wherever it can make a difference. And it *does* make a difference.

Donating used or overstock computer equipment to the East West Foundation can make a difference to you, too—at the bottom line. Because all donations are tax-deductible. And all types of computer equipment are welcome.

To arrange for a donation or for more information, please call:

EastWestFoundation
49 Temple Place
Boston, MA 02111
(617) 542-1234
Fax (617) 542-3333

EAST WEST
EDUCATIONAL DEVELOPMENT FOUNDATION

A Not-For-Profit Corporation

Macworld SHOPPER®

MAC PROFESSIONAL

We only sell brand new products with full one year part & labor warranty. Dealers, Consultants and Int'l orders welcome.
19801 Ventura BLVD. Woodland Hills, CA. 91364 Prices are C.O.D. and Subject to change. in business since 1988.

Phone (818) 719-9200 We Gurantee best pricing **Fax (818) 719-9115**

Power Mac

6100 8/160	1727
6100 8/250-CD	2177
6100 AV 8/250-CD	2447
7100 8/250	2697
7100 AV 8/500-CD	3647
7100 16/500	3137
7100 24/1GB	3737
8100 8/250	3797
8100 16/500	4197
8100 32/1GB	5197
8100 64/1.7GB	6777
8100 AV 16/500-CD	5097

Quadra

840 AV 8/230-CD	2977
840 AV 16/500	3077
840 AV 32/1Gb	4177
840 AV 64/1.7Gb	5477
650 8/230	1977
650 24/500	2777
650 40/1Gb	3577
650 72/1.7Gb	4977
660 AV	CALL
610	CALL
605	CALL
950	CALL

PwerBooks

New PowerBooks Have Arrived

165 / 180 / 180 Color
4 / 8 / 12 / 14 MB RAM
80 / 160 / 240 / 340 MB HD
Any Configuration

G. Village Mercury	327
G. Village Gold	287
Express Modem	197
Supra 14.4K	237

Printers

Laser Select 310	497
Laser Select 320	897
Laser Select 360	1447
Laser Pro 630	1967
Laser Pro 810	4377
HP 4SI MX	4377
HP 4MP	1347
HP 1200C/PS	2047
HP DW 560C	587
HP DW 310	317
Color Stylewriter Pro	597
Citizen Notebook Prnt II	247

Monitors Apple

14/14" Plus	427/297
14" AV	627
Multiscan 20	1987

Sony NEC

1430 / 1730	547 / 1027
17SE	1187
2036 / 2038	1997 / 2277
3FGE / 4FGE	617 / 677
5FGP / 6FGP	1187 / 2187

Supermac

17T	1027
20TXL	2377
21"	CALL
Thunder 24	1677
24PDQ Plus	997
Color Pivot	795
Precision 17	1197
Precision 20V	1977

Audio Video Production

Digital Film DV 2050	3377
Thunder II	2377
Video Vision Studio	3277
Pinnacle Recordable CD	3677

Scanners

UMAX 630	747
UMAX 840	997
UC 1260	1497
HP IICX	957
SCANMAKER II	697
Scanmaker IIXE	1037

DUO

250 4/200	1887
250 12/200-M	2397
270C 4/240	2677
270C 12/240M	3097
Dock w/230 HD	577
Express Modem	297

Peripherals

88/44C	477
Super Floppy	197
Apple Mouse II	67
Teleport Gold	287
Teleport Mercury	327
U.S. Mac & Fax	217

We Specialize in custom made configurations

CIRCLE 495 ON READER SERVICE CARD

Mac S·A·L·E INTERNATIONAL

LATEST SPECIALS

FREE SOFTWARE • OVER $200.00
With The Purchase Of Any CPU
(Manufacturer's SRP, Limited Time Offer, While Supplies Last • Upgrade to Over $500.00 SRP of software for only $25.00)

NEW

Mac LC 2/40 System $799.00
Standard II Keyboard
14" Color Plus Monitor

New Centris 610 4/80 w/EN	$899.00
New LC 2/40	$399.00
New IIci 5/80 w/cache	$999.00
New Quadra 800 8/500 w/CD	$2499.00
New Personal LW NT	$599.00
New Laserwriter Select 300	$499.00
New Conner 543MB 3.5" Int HD	$399.00
New Conner 543MB Extl HD	$479.00
New LC Ethernet Cards	$49.00

SPECIALS

Microsoft Word	$149.00
Microsoft Word Upgrade	$70.00
SuperPaint	$25.00
Math Rabbit	$10.00
Write Now	$49.00

Call For Additional Close-out Software!!

External Hard Drive Case **$69.00**

We carry a complete line of Macintosh repair and replacement parts....
(Logic Boards, Power Supplies, Drives, etc.)

USED

Mac II	1/0	$199.00
Mac IIcx	1/0	$399.00
Mac IIsi	3/40	$429.00
Mac IIsi	5/80	$529.00
Mac LC II	4/40	$449.00
Mac IIci	5/0	$699.00
Mac IIfx	4/0	$899.00
Quadra 700	4/0	$1099.00
PBook 170	4/40	$1099.00

System Special - $799.00
Used Mac IIsi 3/40
New Apple 14" Color Plus
Used Apple Std. II Keyboard

1-800-729-7031

Prices represent a Cash Discount - off Full Price. Returns at discretion of Mgmt./15% Restocking fee.

WE WANT TO BUY YOUR NEW/USED MAC EQUIPMENT

CIRCLE 401 ON READER SERVICE CARD

SAVE
ALMOST
50%
off the cover price

12 Issues for $24!

When you subscribe today

☐ Send me 1 year (12 monthly issues) of Macworld for $24. Save 20% off the basic subscription rate. Please bill me later.

☐ SAVE EVEN MORE! 2 years (24 monthly issues) for $39.97. Please bill me later.

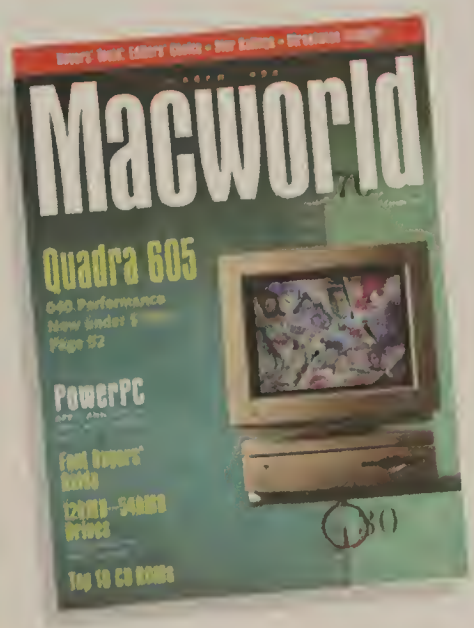
Basic subscription price is $30 for 12 issues. The annual cover price is $3.95 per issue. For Mexican and Canadian subscriptions, please add $18 per year for shipping; $70 for all other foreign countries.

Name _____

Company _____

Address _____

City/State/Zip _____



Macworld

4CBN7

SAVE
ALMOST
50%
off the cover price

NO POSTAGE
NECESSARY
IF MAILED IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 1167 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

Macworld
SUBSCRIPTION DEPARTMENT
P.O. BOX 51666
BOULDER, CO 80321-1666

MacExpress U.S.A

L O W E S T P R I C E S G U A R A N T E E D

Power Macintosh CPU's

PowerPC 6100/66 8/160	$1698
PowerPC 6100/66 8/250/CD	$2098
PowerPC 7100/66 8/250	$2648
PowerPC 7100/66 8/250/CD	$2898
PowerPC 8100/80 8/250	$3785
PowerPC 8100/80 8/250/CD	$3988

PowerPC Logic Board Upgrade



SAVE

Power Mac Upgrade Card	$695
PowerPC 6100/60 Logic Bd	$1085
PowerPC 7100/66 Logic Bd	$1498
PowerPC 8100/80 Logic Bd	$1798

Mac CPUs



Q 605 4/80	$899
Q 610 8/160	$1299
Q 610 8/230/CD	$CALL
Q 650 8/230	$CALL
Q 660AV 8/230	$1729
Q 660AV 8/230/CD	$CALL
Q 800	$CALL
Q 950 8/0	$2769
Q 950 24/1GB	$4119
Q 840AV 8/230	$CALL
Q 840AV 8/230 W/CD	$2999
Q 840AV 16/500/ CD	$3699

Powerbooks





Duo 230 4/120	$1299
Duo 250 4/200	$1779
Duo 250 12/200	$2139
Duo 270c 4/200	$CALL
Duo 270c 12/200/Modem	$CALL
Duo Dock FOR ALL DUOs	$499
PB 145B 4/80	$1297
PB 165 4/80	$1559
PB 165 8/160	$1729
PB 180 4/120	$CALL
POWERBOOK 040 CPU'S	$CALL

Monitors



Apple 14 Color Plus	$309
Apple 14" Color	$449
Apple 14" AV	$629
Apple 16" Color	$959
Apple Multiple scan 20	$1929
Sony 17SE Color Monitor	$1198
SuperMac 17 T Color	$989
SuperMac 20" Plus Monitor	$1539
SuperMac 20- TXL	$2349

Video Boards

Spectrum 24 PDQ+	$989
Spectrum 24 seriesIV	$759
Spectrum Power	$1129
Radius 24XP	$569
Radius Precision Pro 24x	$1459

Apple Printers

StyleWriter II	$279
Color StyleWriter PRO	$659
Personal LaserWriter 320	$898
LaserWriter Selct 360 (10 PPM)	$1499
LaserWriter 360 Fax Modem	$298
LaserWriter Pro 630	$1989
LaserWriter Pro 810	$4298

Hewlett Packard

HP DeskWriter 320 NEW!	$299
HP DeskWriter 560c	$589
HP DeskWriter 310 w/CSF	$389
HP LaserJet 4 ML	$989
HP LaserJet 4 MP 600 DPI	$1399
HP LaserJet 4 M 600 DPI	$1998

Apple HDs

PowerBook 80 MB	$129
PowerBook 240 MB	$389
PowerBook 520 MB	$699
PowerBook 340 HD	$569
Quantum 250 MB HD 3.5"	$259

Peripherals

Global Village PP Gold	$279
Global Village pp Mercury	$359
Geoport Adaptor	$139
Memory for all mac's	save
PowerBook Battery	$69
U-max 840	$949
I-omega mac trans 90	$229

DEAL OF CENTURY

SALE $369

MicroNet 88 MB
Syquest Removable HD
Includes 88 MB Cart, Utility S/W, & Cable

Mon-Fri 9:00 To 6:00 *Since* 1988
1941 Freeman #B
Signal Hills, CA 90804
Fax (310) 498-0032

PRICES REFLECT CASH DISCOUNT & SUBJECT TO CHANGE W/O NOTICE

(310) 498-1230

CIRCLE 443 ON READER SERVICE CARD

ADVANCED MAC SYSTEMS

TEL: (310) 314-7372
FAX: (310) 314-7512
No tax outside CA.
Prices are subject to change without notice

PLI

88C Syquest R/W	499
44MB Syquest	347
Multi SessionCD-ROM	597
Optical128MB	989
Infinity 105 Turbo	685
4GB DAT/Retrospect	1325
10GB DAT/Retrospect	1550
2.4GB Mini Array Int	2990

Quadra

610 8/160	1300
610 8/230-CD	1990
650 8/230	1899
650 8/230-CD	2200
660 AV 8/230-CD	2115
800 8/230-CD	2575
840 AV 8/230-CD	3275
840 AV 16/500-CD	3999
840 AV 16/1Gb-Cd	4825
950 8/0	2855
950 16/1Gb	4085

Power Mac

6100 8/160	1725
6100 8/250-CD	2225
6100 AV 8/250-CD	2455
7100 8/250	2725
7100 8/250-CD	3075
7100 AV 8/500-CD	3675
8100 8/250	3775
8100 8/250-CD	4099
8100 16/1.GB/CD	5499
8100 AV 16/500-CD	4999

Powerbook

165 4/80	1525
165C 4/120	1915
180 4/80	1924
180 4/120	2200
180C 4/160	2525

Monitor

SuperMatch 20TXL	2395
SuperMatch 17T	1045
20" Color Plus	1499
Sony 1730	1035
Sony 17SE1 Multi	1175
NEC 5FGe Multi	1065
14" RGB Display	450
16" RGB Display	929
Radius Color Pivot	949
Radius 21" Display	2199

Scanner

UMAX UC1260	1745
UMAX UC630 LE	847
UMAX UC840	1075
HP ScanJet IICX	979

Printer

PRO 630	1935
Select 310	765
Select 360	1444
Stylewriterll	290
HP LaserJet 4M	1875
HP LaserJet 4ML	975
HP LaserJet 4MP	1345
HP DJ 1200c/PS	1995

Video Card

Thunder II	2975
Thunder II LI	1875
Thunder 24	1850
Spec.24 PDQ+	1295
Spectrum 24 IV	750
Raduls 24xk	685
Raduls 24xp	650
Paint Bd.Turbo	1066
Paint Bd.Turbo LI	747

Hard Drive

520MB/1.0GB	555/835
230MB/170MB	245/199

CIRCLE 470 ON READER SERVICE CARD

1-800-334-KIWI

Quadra

605 4/80	$888	650 8/230	Call
605 8/80	$1025	650 16/500	$2599
605 8/230	$1175	650 24/1Gig	$3249
Quadra 610, 660AV, 840AV	Call		

Power Mac

6100/60 8/160	Call	7100/66 16/500	$3249
6100/60 16/500	$2349	7100/66 24/1Gig	$3999
7100/66 8/250	Call	8100/80	Call

PowerBook

Please call for all PowerBook prices.
145b, 165, 180, 180c, Duo 230, 250, 270c

Monitors

Magnavox 14"	$259	NEC 4FGe	$625
Apple ColorPlus	$299	NEC 5FGp	$1099
Apple 14" Trinitron	Call	Sony 1320	$349
Apple 14" AV	Call	Sony 17SE1	$1149
Radius Monitors	Call for best price.		

Printers

Stylewriter II	$289	Deskwriter 520	$289
Color Stylewriter	Call	Deskwriter 560c	$585
Laser Select 320	Call	HP Laserjet 4ML	$985
Laser Select 360	Call	HP 4MP & 4M	Call

All Products Are New.
Visa & Mastercard No Surcharge.
Better Business Bureau Member.

Kiwi Computers, PO Box 67381, L.A., CA 90067
Toll Free (800) 334-5494 Fax (310) 286-9667
In California and Overseas (310) 553-4507
Hours: Mon-Fri 7.30am-6pm, Sat 9am-2pm PST

All products have a 1 year warranty.
Returns are subject to a 15% restocking fee.
Prices subject to change. Quantities may be limited.
Not affiliated with Kiwi Software, Inc.

CIRCLE 404 ON READER SERVICE CARD

Wanted: Used Macs!

- *We'll pay you cash* for used Mac equipment! Call now for FREE quote.
- We also sell refurbished Macs w/1-yr warranty & 10-day money-back guarantee. All models.

RENTEX (800) 545-2313

CIRCLE 521 ON READER SERVICE CARD

MacBYTE



Buy • Sell • Trade Macintosh Computers

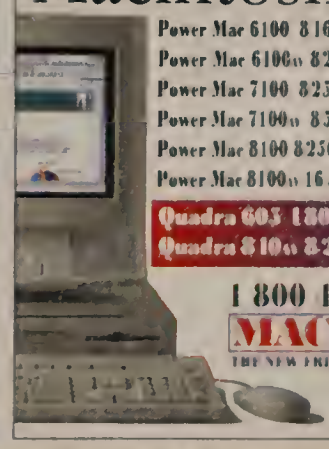
Preowned Macs with Warranty
Cash For Your Mac or Peripheral
Low & High End Custom Setups

800-432-BYTE

Open Monday—Saturday • 22775 PCH, Malibu, CA 90265 • FAX 310-317-1583

CIRCLE 428 ON READER SERVICE CARD

Macintosh



Power Mac 6100 8/160	$1,576
Power Mac 6100w 8/250 CD	$2,251
Power Mac 7100 8/250	$2,512
Power Mac 7100w 8/500 CD	$3,155
Power Mac 8100 8/250	$3,610
Power Mac 8100w 16/500 CD	$1,868
Quadra 605 4/80	$769
Quadra 840w 8/230	$2,713

1 800 404-9976
MACNET
THE NEW FRIENDLY SERVICE

CIRCLE 543 ON READER SERVICE CARD

MAC CITY COMPUTERS

ALL SYSTEMS ARE NEW WITH ONE YEAR WARRANTY
NO TAX OUTSIDE CALIFORNIA
WE CARRY FULL LINE MACINTOSH SYSTEMS SINCE 1987
INTERNATIONAL ORDERS
VISA-MC-AMEX OK

Tel: (818) 385-0080
Fax: (818) 385-0081
13860 Milbank St , Sherman Oaks , CA 91423

Quadra

Q650 16/500 CD	CALL
Q650 8/230/CD	1949/2179
Q610 8-230-CD	CALL
Q610 8-80/160	1199/1299
Q605 4/80	899
Q605 8/160	1129
Q840 8-230 / CD	2699/2879
Q840 16-500/ CD	3299/3469
Q840 24-1.2G CD	4099
Q950 8-0/500/1.2GIG	CALL
660 8-230 / 500	1529/1829
CENTRIS 650/610	CALL

PowerPC Upgrades SAVE With Any Purchase
ASK FOR LATEST PRICES

Powerbook

180c 4-80/4-160	2199/CALL
180c 14/250-14/340	Call
180 14/340	2949
180 4/80	1899
180 14/250	Call
165 4/80-4/160	1499 /1699
165 14/250	Call
160 4/40 - 8/160	Call
165c 4/80-4/256	1599/call
145b 4/40-4/80	1149/1249
Duo 270c 12/240 w/m	Call
Duo 250 4/200 w/m	1749
Duo 230 4/80	1250
4MB Powerbook	189
10M Powerbook	449
Internal fax modem	CALL

Printer & Scanners

Pro 810/630	Call
Select 300/310/360	Call
Stylwriter II	289
Stylwriter port	398
HP 4M/4ML/4MP	Call
HP DJ 1200C	1849
HP Deskwriter 560c	579
HP Scanjet IIcx	949
UMAX 840	1049
UMAX 1260	1509
Microtek Scan IIXE	969

Monitor

APPL 14" PLUS	295
Apple 14" RGB	449
Radius 20V	1739
Radius Full Page	459
Rad VideoVision Studio	CALL
Supermac 17/20T	899/call
Supermac Thunder II	2399
Supermac Thunder 24	1799
Sony 1320/1730	329/995
Sony 2036/2038	CALL
Nec 3FGE/4FGE	595/695
Nec 5FGP/6FGP	CALL

PowerPC

ALL CONFIGERS AND UPGRADES

8100 16/500 W CD	CALL
8100 24/1G1G CD	5399
8100 8/250 W CD	4099
7100 8/500 W CD	3299
7100 8-250/1G1G	CALL
6100 8-160	1699
6100 8-500 W CD	2449
6100 8-250 W CD	CALL

PLI

44/88C EXT	519
44MB EXT	379
105MB EXT	689
128 OPTICAL	CALL
OEM 88C Syqwest	479
MINI ARRAY 1G	1995

CD'S & Hard Drive's

FWB 2g Hammer Wide ex	4099
SlegeHammer 2gb Array ex	2499
Seagate Baracuda 2.4g ex	1799
Seagate 3.4g 11ms ex	2239
Micropolis 3.6g AV ex	2279
Micropolis 1.2g 8ms ex	899
Quantom 1g 9.5msc	819
QUANTOM 540MB int	479
QUANTOM 240MB int	239
Quantom 80MB int	129
Quantom 256 go DR	339
Quantom 340 go DR	479
TOSHIBA 340 GO DR	489
Fujitsu 520mb int	499
Fujitsu 1.1g 8.5msc int	849
Fujitsu 2.4gig 11msc	1699
Pinnacle Micro 650 opt	2675
APPLE CD 150	165
APPLE CD 300 INT	325
NEC 3XVE Multispin	585
TOSHIBA CD	CALL

ASK FOR LATEST PRICES
WE DON'T TRADE OR SELL USED COMPUTERS
WE SELL ONLY NEW SYSTEMS

CIRCLE 442 ON READER SERVICE CARD

DATA MICRO COMPUTER

Dealers & International Sales Welcome!

800-345-1234
TEL:(310) 398-3300
FAX:(310) 391-2488
3847 Grand View Blvd. Los Angeles, CA 90066
Call us last with your best prices!
Best Prices,Service & Delivery
Next & same day shipping avaiable! No sales tax for out side of California orders.
Prices subject to change with out notice!

POWER PC

6100

8/160	1652.
8/160CD	1952.
8/250CD	2126.
16/250 Win.	2326.
AV 8/250CD	2390.
AV 16/250CD	2690.

7100

8/250	2652.
8/250CD	2977.
16/250 Win	3052.
8/500CD	3152.
16/250CD	3190.

8100

8/250	3790.
8/250CD	4026.
16/500	4352.
16/500 Win	4677.
16/1Gig CD	4952.

QUADRA'S

605 4/80	895.
605 8/160	1095.
610 8/160	1295.
610 8/230CD	1877.
650 8/230	2295.
650 8/230CD	Call
660AV 8/230	Call
660AV 8/500CD	Call
800 8/230	2295.
800 8/500CD	2852.
840AV 8/230	2652.
840AV 8/230CD	2895.
840AV 8/1.2	3326.
840AV 64/1.2	5595.
950 8/230	3152.
950 16/1GB	4152.
950 8/425	3252.

SONY 20" Trinit. $ 1599.
Multimode Color

PowerBook's

145B 4/40	1272.
160 4/80	1450.
165c 4/80	1595.
180 4/80	1990.
180c 4/80	2380.
180c 14/120	3090.
Duo 270c 4/240	Call
Duo Dock station	Call
BTI Batt+chrgr	139.

NewGen

Imager Plus 6	3695.
Imager Plus 6L	3350.
Imager Plus 12	5650.

EPSON

ES-800C Pro	959.
Actionscanning	249.

SHARP

JX-325	Call
JX-610	9899.
Printers	Call

PRINTERS

Apple ColorStyl.	625.
StyleWriter II	295.
Portable Styl.	95.
Pro 630	1950.
Pro 810	4352.
Select 300	495.
Select 310	677.
Select 360	1469.
DeskWriter 560c	585.
D.Writer 1200c	1895.
HP Laser 4M	1875.
HP Laser 4ML	989.
HP Laser 4MP	1377.

Daystar

Turbo 040/40	1219.
Turbo 040i/33	739.
Value 040/40	1225.
Fastcache Qud.	365.
50Mhz powercache	549.
Diskrunner	569.

UMAX

UC630LE	675.
UC840	895.
UC1260	1195.
UC1200SE	2495.
Transparanci	Call

MICROTEK

ScanMaker II	599.
ScanMaker IIxe	975.
ScanMaker IIsp	775.
ScanMaker IIG	475.

SUPERMAC

17" Mutiscan $735. color

PLI

Infinity 40	329.
Infinity 88	499.
Infinity 105	539.
Quick SCSI	319.
MiniArray 1gb	2095.
128 IBM optical	1049.
1.3GB Tahiti II	3167.

RADIUS

Intelecolor 20	2495.
Intelecolor 20v	1775.
Precision pro 24x	1395.
Precision pro 24xp	475.
Precision pro 24xk	595.
Precision pro 8xj	495.
Stagetwo rocket	1495.
Videovision studio	3195.
Videovision nubus	1495.

FARGO

Color printer	959.
Photo Realis.upg.	249.

RasterOps

PaintBoard Turbo	1095.
21" Dual mode	2399.
Moviepak	1149.
DuoMate	399.
20/20 Color	1499.
20T Multiscan	2489.
15" Portrait	399.

NEC

3FGE	599.
3V	639.
4FGE	725.
5FGE	1095.
5FGP	1225.
6FGP	2395.
3PG	2245.

DAT/OPTICAL

2.1 Gig DAT	899.
8 Gig/DDSII	1195.
128MO Sony	995.
256MO Sony	1195.

CIRCLE 508 ON READER SERVICE CARD

Tel (818)785-2800

MacLink

Fax (818)785-3100

We pride ourselves in quality service, product availability & competitive pricing

5% Above Cost VERIFIED

800-858-4622
Dealers & Consultants Super Store
Volume Discounts Available • Worldwide Shipping

MacLink 15500 Erwin St #2002 Van Nuys CA 91411

Groller Encyclopedia CD-ROM $59 w/System purchase

Prices are subject to change. And reflect cash discount

PowerMac 8100/80, 16-1000 w/CD	$3662	PowerMac 7100/66, 16-250 w/SW	$2968	PowerMac 6100/60, 16-250 w/SW	$2231
PowerMac 8100/80AV, 16-500 w/CD	$3892	PowerMac 7100/66AV, 8-500 w/CD	$3499	PowerMac 6100/60AV, 8-250 w/CD	$2290
PowerMac 8100/80, 16-500 w/SW	$4568	PowerMac 7100/66, 8-250 w/CD	$2794	PowerMac 6100/60, 8-250 w/CD	$2031
PowerMac 8100/80, 8-250 w/CD	$3892	PowerMac 7100/66, 8-250	$2551	PowerMac 6100/60, 8-160	$1612
PowerMac 8100/80, 8-250	$3662				

Quadra

Quadra 840AV, 16-1000 w/CD	$4290
Quadra 840AV, 16-500 w/CD	$3745
Quadra 840AV, 8-230 w/CD	$3025
Quadra 840AV, 8-230	$2790
Quadra 800, 8-230	$call
Quadra 800, 8-500 w/CD	$call
Quadra 660AV, 8-500 w/CD	$2236
Quadra 660AV, 8-230 w/CD	$1930
Quadra 660AV, 8-230	$1595
Quadra 650, 8-500 w/CD	$2379
Quadra 650, 8-230 w/CD	$2200
Quadra 650, 8-230	$1901
Quadra 610, 8-230 w/CD	$1881
Quadra 610, 8-230	$1579
Quadra 610, 8-160	$1252
Quadra 605, 8-160	$1125
Quadra 605, 4-80	$858

NoteBooks

Pwrbk 180c, 4-160 w/modem	$2540
Pwrbk 180c, 4-160	$2398
Pwrbk 180c, 4-80	$2196
Pwrbk 180, 4-120 w/modem	$2279
Pwrbk 180, 4-120	$2119
Pwrbk 180, 4-80	$1992
Pwrbk 165, 4-160 w/modem	$2066
Pwrbk 165, 4-160	$1856
Pwrbk 165, 4-80	$1554
Pwrbk 145B, 4-120	$1463
Pwrbk 145B, 4-80	$1260
ALL Unlisted Models	$call
Duo 270c, 12-240 w/modem	$2940
Duo 270c, 4-240	$2592
Duo 250, 12-200 w/modem	$call
Duo 250, 4-200	$1794
ALL New Powerbooks	$call

Displays

Apple 16" Color Display	$929
Apple 14" AV Color Display	$664
Apple 14" Color Display	$473
Supermac PressView 21	$3128
Supermac 20•TXL	$2380
Supermac 17•T	$1046
RaserOps 20T	$2331
RaserOps 20/20	$1547
RaserOps ClearVue/15	$431
Radius IntelliColor/20	$2579
Radius TPD/20	$811
E-Machines T16II MR	$1149
NEC 4FGe	$728
NEC 5FGp	$1398
Radius PrecisionColor 17	$1181
Sony 17SE1	$1183
ALL Unlisted Models	$call

Printers/ Scanners

Apple LaserWriter Pro 810	$4361
Apple LaserWriter Pro 630	$1946
Apple LaserWriter Select 360	$1451
Hewlett Packard 4M	$1865
Hewlett Packard 4MP	$1336
Hewlett Packard 4ML	$976
Hewlett Packard 1200c	$1446
GCC SelectPress 1200	$call
GCC SelectPress 600	$3667
GCC BLP Elite	$789
Supermac ProofPositive	$call
All LaserMaster	$call
All NewGen	$call
3M RAINBOW 2720	$20K
Hewlett Packard DW 560c	$536
Hewlett Packard IIcx	$976
UMAX, All Models	$call

Add On's

PowerPC Upgrades	$call
PowerBook/Duo Accessories	$call
Apple Express Modem 14.4	$179
Apple GeoPort	$125
Apple Extended KB	$155
Apple Adjustable KB	$159
Global Village Gold	$289
Global Village Platinum	$349
Supermac T-II GX1360	$2992
Radius PrecisionColor 24	$1929
RasterOps 24XLi	$1264
Radius Editing Aces Suite	$2929
Radius VideoVision Studio	$call
E-Machines Futura II SX	$476
Seagate "Barracuda" HDs	$call
DIGIDESIGN	$call
AND MORE . . .	CALL

CIRCLE 430 ON READER SERVICE CARD

ALL CUSTOM CONFIGURATIONS AVILABLE - FULLY TESTED!
New Products ONLY! One Year Limited Warranty

Sales
310-858-1000

Sales To Corporate & POWER User's ONLY!
All PhotoShop, DTP Graphics Users, Govt. & Schools

Att. CONSULTANS - Mac VAR's - Volume Buyers
We Offer Better Pricing / Availability / Service
Than The National Distribution Channel!

FAX# (Toll Free) 800-900-2983
Please Direct All Your Bid & Quotation Inquieries Or Questions

CORPORATE SPECIASLISTS
Mac Shopper SPECIAL® CLUB

PowerPC READY!
Quadra 840-AV
PSound Audio Visual Very Powerful 68040-40mhz
8mb/250hd CD $2899
16/500-CD 3849 • 16/1-GB/CD 4199
64mb/1.7-GB A/V 2mb V-ram(24-Bit) w/CD. 6650
••• Extra Ram 8mb-ea 325 16mb-ea 649 32mb-ea 1249

PowerMac
Powered with POWERPC Chip

8100/80
8/250 CD $3889
A/V 16/500-CD 4899
16/1000-CD 5299
40/1-GB hd 5699
72/1 7-GB hd 7199

• 7100/66
8mb/250hd 2569
8/250 - CD 4349
40/500-CD 5699
24/1-GB hd 3850
A/V 8500 CD $3499

• 6100/60
8mb/160hd $1629
8mb/250hd $2029

HARD-DISK &+
Quantum Ext. 500 ..549 • 230 ..325 • 1-GB .849
Micropolis Ext. 1-GB 849 • 1.6-GB 1149 • 1.6 A/V 1299
Ext. 2-GB 1549 • 1-GB A/V 949 • 3-GB 2049
SyQuest 88c 88/44-RW Ext. w/Cartridge 459
MaxOptics Tahiti-2M 1GB M.O. 2499 Tahiti-3 3299
WangDAT 2-GB DAT Tape B/U Ext. Kit ... 999
Seagate Barracuda 7200-RPM 2-GB -Int 1749

TI MicrpLaser Pro (ps/23) 600 Bppm...1349
NewGen Imager-Plus 12 w/EtherNet 1200-dpi 6199
GCC SelectPress 600..... 3549

SONY Monitors
1430 14" 1024 (Very-Flat) 525
17se-1 17" (1280-Res.) 1149
2038 20" Hi-End(1600-Res.) 1999
2036 20" 1280-Res. 1899

Nokia - NEC
Eurpean Made!
Nokia 17" Trinitron MPR-II 999
Nokia 15" .28mm Flat 75HZ...549
NEC 4-FGe 15" Digital 669 • 3FGe 15" 599
NEC 5FGp 17" 1099 • 6FGp 21" 2149

All Systems With CD-Rom Include
4-FreeCD's
Most Every Brand Available
These Prices All Include a Cash Discount. Other Type Of Payments Are at Higher Cost! Limited Avail.

IF PRICES ARE'NT HIGHLY COMPETATIVE & CURRENT, PLEASE CALL US FOR UPDATED PRICES. All Items at limited Availability. Prices May Change.

CIRCLE 599 ON READER SERVICE CARD

LOWEST PRICES BEST SERVICE
QUADRAS POWERBOOKS
PRINTERS MONITORS
POWER PCs
CALL FOR QUOTES
310-358-9000
FAX 310-358-9100
Dealers & International Orders Welcome
Same Day Shipping in USA
We Only Sell Brand New Systems
Full One-Year Warranty
"Best Computer Source"
–Computer Magazine

COMPU AGE
THE SOURCE TO MACINTOSH WORLD
318 N. LA CIENEGA • LOS ANGELES, CA 90048

CIRCLE 542 ON READER SERVICE CARD

Syquest Cartridges



270MB..... $95 (5+)
105MB..... $58.99 (5+)
88MB..... $88.99 (5+)
44MB..... $58.99 (5+)

SuperMicro We specialize in Image Processing Fax: 310-782-5974
We also Sell & Lease Systems
800-352-3415

CIRCLE 442 ON READER SERVICE CARD

Optical Cartridges



Sony 1.3GB $135
OEM 650MB $87
Komag 128MB ..... $33 (5+)
Princo 128MB..... $28.99 (5+)

SuperMicro We specialize in Image Processing Fax: 310-782-5974
We also sell Hard/Syquest/Optical Drives
800-352-3415

Visa NEW TECH CONSULTING MC
800-797-6710 Monday thru Friday 7AM to 5PM PST Saturday & Sunday 8AM to 3PM PST 714-838-0529

Complete Internal & External Mounting Kits & Bezels

Optical Drives
128mb Fujitsu $750
256mb Most Int. $930
Optical Cartridges
128mb $32 256mb $70
650mb $110 1GiG $120
Syquest Removables
Syquest 105 Int. $340
Syquest 105 Ext. $415
Syquest 88C Int. $370
Syquest 88C Ext. $430
Syquest Cartridges
105mb $58 88mb $89
44mb $58

Monthly Special
Seagate 1.8 Gig Int. $750
Syquest 270 Int. $540
Archive Viper 250 $340
Mirror 1200 DPI Scanner $1379
with Photoshop Full Version
We also handle
Hard Drives • UPS • Monitors
Scanners • Printers • Plotters
Anything and Everything You Need
Trying to find something and not having any success? Want to save yourself time? Call or fax your needs and we'll do the rest.

Quantum Drives
LPS 240 MB $264
LPS 525 MB $585
Prodrive 1.5 Gig $870
Prodrive 1.2 Gig $997
Prodrive 1.8 Gig $1150
Tape Drives
Archive Viper 525 $545
Archive Turbo 1.3 Gig $865
Sony 2000 2Gig $945
Sony 4000 4Gig $945
Sony 8000 8Gig $1050

Fax: 714-573-5795
Prices and availability are subject to change w/o notice

CIRCLE 567 ON READER SERVICE CARD

LIMITED
ADVERTISING BUDGET?

Macworld Shopper offers
a great way to reach
550,000
active shoppers.

IMAGE MACHINES 1-800-909-7879 FL & MA
FREE UPS SHIPPING ($1100 MIN. ORDER)
Power Macintosh • Memory • Printers • Scanners
YARC/DAYSTAR PowerPC Rendering/Photoshop Computers
HITACHI/NANAO/NEC/NOKIA/SONY/ViewSonic Monitors
MITSUBISHI Multimedia Monitors to 42" • Video Projectors
NONLINEAR VIDEO EDITING & ANIMATION Systems & Software
VIDEO EXPLORER • DATA TRANSLATION • Radius VideoVision
BTS/SONY/Panasonic/Ikegami Video Cameras/VTRs/Monitors
Laser Videodisc/CD-ROM/Film Recorders • Scan Converters
Electric Image • CoSA • VIDI Presenter Professional • STRATA
Radius • RasterOps • SuperMac • GCC • HP • KODAK • EPSON • UMAX
SAVE $400! NO PAYMENTS! NO FINANCING CHARGES FOR 90 DAYS

CIRCLE 464 ON READER SERVICE CARD

Big Mac
Computers, Inc.
Division of WCN

10837 Santa Monica Blvd. Los Angeles, CA 90025
Tel: (310) 470-7099 • Fax: (310) 470-8099

We carry everything for MAC • Since 1987

Custom configuration for all Power PC SoftWindow & Audio-Video & D.T.P.

Power PC's

8100	8/0	3750
8100	16/500	4495
8100	40/1.8	6899
8100	128/2.4	10450
8100	256/3.4	16850
8100AV	8/0	4350
8100AV	40/1.8	6595
8100AV	128/2.8	10650
8100AV	256/34	17295
8100AV	16/1.7	5495
7100	8/0	2595
7100	24/500	3695
7100	72/108	8395
7100	136/2.4	11895
7100AV	16/500CD	4050
7100AV	48/1.7	6295
7100AV	72/1.2	6895
7100SOFTWINDOW	16/250	3227
6100	8/0	1651
6100	8/250CD	2295
6100	16/500	2683
6100	32/1.2	3295
6100AV	8/250CD	2495
6100AV	16/500	2895
6100SOFTWINDOW	16/250	2450

Quadra's

840AV	0/0	2450
840AV	16/500	3450
840AV	64/2.0	5895
800	8/500	2495
950	8/400	3195
950	64/1.2	6150
605	8/230	1275
610	16/230	1999
650	16/500	2795

UMAX

UC630	799
UC840	995
UC1260	1295
UC1200SE	2495
Tranparency	495

New Items

Quick take	695
Color Pro	595
Newton 110	649

Printers

320/630	950/1949
300/310	495/650
360/810	1450/4395
4M/4ML	1895/1095
HP310	395
Seiko Dysub	CALL
Apple Color Printer	595

Power Books

180	8/80	2195
180	14/340	3195
180C	14/340	3395
250	12/240	2195
270C	12/240M	3150
Black Brids		CALL

540 M.B. H.D. avil. for P.B.

SUPERMAC

radius

Super MAC

20TXL/17T	2195/995
Thunder/24	1650
Thunder IIGS 1360	2950
Proof Positive	12,900

AGFA

Studio Scan	1050
Studio Scan Tranp.	345
Arcus Plus	3295
Arcus + Tranp.	795

Apple Monitor

14" HiRes	425
16"/14" Plus	1025/325
14" AV/20"	599/2039

RASTEROPS

Specials

Sony 1936 20" Tri.		1650
Nikon Cool Scan.		1750
Centris 610	4/80	975
Duo 250	4/230	1695
Duo Dock	230HD	595
Apple CD	150	139
Toshiba 800 M.B. H.D.		550

Demo Mac's

840	8/230	2395
800	8/230	1850
950	8/400	2495
G	5/80	895
Classic	1/40	395
160	4/80	995
MAC Plus	2.5 Meg	225

GCC

Selet Press 600	3697
Selectpress 1200	5595
Colortone	5995

NEC

POWER PC UPGRADE

UPGRADE CARD	682
6100/60AV	1395
7100/66AV	1695
8100/80AV	1995

Adult CD Titles!!
many titles to choose from
$33.95 each or 4 for $104.

Kodak

Color Ease	6495
450 GL	1495
PCD Writer 200	CALL

Exchange any OLD MAC to Power PC

CALL FOR NEW LINE OF POWER BOOKS

AMERICAN EXPRESS MasterCard VISA

Call for APPLE 3rd party products • International Orders, Visa, MC & AmEx Welcome • Next Day Shipping for U.S.A. & International Prices are subject to change w/o notice • All prices shown are C.O.D. Prices

Tel: (310) 470-7099 • Fax: (310) 470-8099

CIRCLE 453 ON READER SERVICE CARD

MAC Touch
800-494-6666

DIVISION OF CRT COMPUTERS
SINCE1989
WE SELL ONLY NEW SYSTEMS WITH ONE YEAR WARRANTY
VISA & M.C WELCOME
DEALERS & INTERNATIONAL ORDERS WELCOME
All prices reflect cash orders only & are subject to change without notice.

TEL (310) 268-5544
FAX (310) 473-0057

Power Mac 8100

AV 16/500/CD	4949	8/250	3749
8/250/CD	3989	16/500/CD	4749

Soft Windows 16/500.....4649

Apple Monitors

14" Clr Plus	299	Multi Scan 20	1949
14" Hi Res RGB	449	14" AV	595

250 (Power Book Duo) 270 C

4/200	1769	4/240	2555
12/200/M	2555	12/240/M	3095

840 Quadra 650

8/230	2785	8/230	1949
8/230/CD	2995	8/230/CD	2195

Other Quadra's .....Call

Power Mac 7100

8/250	2595	AV 8/500/CD	3595
8/250/CD	2895	AV 8/1 GIG/CD	3995

Soft Windows 16/250.....2969

Ink Jet Printers Laser

Clr Styl Writer Pro	595	Select 360	1529
HP DJ 560C	595	HP 4MP	1349

Scanners

Scanmaker IIXE	995	Color One Scanner	969
UMAX 840	1149	HP IICX	959

610 Quadra 605

8/160	1325	4/80	895
8/230/CD	1995	8/160	1195

MEMORY UPGRADES AVAILABLE

Power Mac 6100

AV 8/250/CD	2349	8/160	1649
AV 8/500/CD	2649	8/250/CD	2095

Soft Windows 16/250.....2295

Monitors

Sony	Call	Super Mac	Call
NEC	Call	Radius	Call

Power Book

180	Call	180C	Call

New Power Books In Stock

Other Apple Products

Extended KB II	155	Geo Port	135
Adjustable KB	145	Ethernet NB	89

Free Custom Configuration

CIRCLE 487 ON READER SERVICE CARD



$$$

MacAttack

(800) 299-MACS (800) 299-6227
409.690.5353 (Fax)

We Attack High Prices!!

Prices subject to change — please call for latest pricing. We carry hundreds of items — call for availability. Your satisfaction is our goal.
Prices are C.O.D. and subject to change. International Orders and Fax Orders Welcome!

Mac Minis

	$920
	$850
	$2150
	$890
	$1170
	$1435
	$350
	$1650
	$1960
	$1935
	$2250
	$2790
	$1780
	$1705
	$1965
	$2505
	$2105
80	$2655
80	$2890
800 8/1000	$3265
Quadra 84	$2755
Quadra 840av 8/230/CD	$3010
Quadra 84 16/500/CD	$3810
Quadra 84 16/1000/CD	$4420
	$2715

One Year Warranty On New Macs !!

Modems

GV PowerPort Bronze	$90
GV PowerPort Silver	$260
GV PowerPort	
GV PowerPort Mercury	$330
Geoport Adapter	$115
SupraFax Modem	$225

PowerMacs!!

6100/60 8/160	$1650
6100/60 8/250 CD	$2080
6100/60 AV 8/250 CD	$2360
6100/60 SoftWindows 16/250	$2285
7100/66 8/250	$2630
7100/66 8/250 CD	$2885
7100/66 AV 8/500 CD	$3620
7100/66 SoftWindows 16/250	$3070
8100/80 8/250	$3665
8100/80 8/250 CD	$3890
8100/80 SoftWindows 16/500	$4580
8100/80 AV 16/500 CD	$4880
8100/80 16/1000 CD	$5315
Apple Multiple Scan 20 Display	$1915
Apple Quick Take 100 for Macintosh	$670
Apple Color StyleWriter Pro	$570

(Includes 4 Ink Cartridges & Cable)

Monitors

Apple Color Plus 14"	$290
Mac 14" Trinitron	$405
AudioVision 14'	$610
Mac 16"	$920
Sony 1430 14"	$580
NEC 3FGE 15"	$600
NEC 4FGE 15"	$700
NEC 5FG 17"	$1260
NEC 6FGp 21"	$2480
RasterOps Sweet 16 16"	$965
RasterOps 20/20	$1640
RasterOps 21"/24XLI	$2315
RasterOps 20t	$2490
E Machines T16	$1175

Scanners

HP Scanjet IIcx	$980
HP Scanjet IIC	$730
Interface ForScanjet	$265
One Scanner	$705
Color One Scanner	$940

Powerbooks

145 4/80	$1200
145B 4/80	$1305
145B 4/120	$1520
165 4/80	$1500
165 4/160	$1800
165 4/160 Modem	$2145
165c 4/80	$1555
180 4/80	$1895
180 4/120	$1975
180 4/120 Modem	$2295
180c 4/80	$2275
180c 4/160	$2610
180c 4/160 Modem	$2725
Duo 230 4/80 (Adpt & Drive)	$1430
Duo 230 4/120	$1430
Duo 230 4/160 (Modem & Dock)	$2200
Duo 250 4/200	$1815
Duo 250 12/200 Modem	$2295
Duo 270c 4/240	$2580
Duo 270c 12/240 Modem	$3055
Duo Minidock	$405
Duo Dock	$475

We ship via borne Express
International shipments
handled by DHL
COD, MasterCard and VISA
accepted
Hours. M-F 8-6 CST

15% Restocking Fee On All Returned Merchandise.

FREE Mousepad With Every Order!!

Supermac

SuperMatch 17T	$995
SuperMatch 20 Txl	$2475
Thunder 24	$2230
Thunderstorm Pro	$2745
Thunder II Light	$2850
Spectrum 24 PDQ+	$1285
T-16 II	$1195
T-20	$2485
Futura SX	$345
Futura MX	$600
Futura II LX	$775

Printers

ImageWriter II	$385
StyleWriter II	$290
Portable StyleWriter II	$385
LW Select 310	$780
LW Select 320	$860
LW Select 360	$1435
LW Pro 630	$1910
LW Pro 810	$4375
HP Laserjet 4SI	$3190
HP Laserjet 4SI MX	$4670
Laserjet Toner	$120

Software

Photoshop	$540
PageMaker 5 0	$540
After Dark	$29
Filemaker Pro 2 1	$260
Canvas 3.5	$259
Quicken 4.0	$39
Excel 4.0	$305
Word 5 0	$305
Office 3.0 (for CD-ROM or Disk)	$460

MacAttack will beat any advertised price on software or send you a free mousepad!

CDs

Apple CD 300	$360
Apple CD 300i Kit	$290
Apple Power CD	$360
Apple CD Multimedia Kit	$550

(Includes Apple Design Power Speakers, CD 300 External, & 4 CDs)

PLI (SyQuest)

External	
(Includes Formating Software & 1 Cartridge)	
Infinity 44	$340
Infinity 44/88c	$485
Infinity 105	$510
Infinity 270	$600
Internal	$CALL
Cartridge 44/88/105	$60/90/60

Newtons

Newton Message Pad 110	$570
Newton Communication System	$630
Newton Professional	$690
1 MB Storage Card	$110
2 MB Flash Storage Card	$165
Connection Kit for Macs	$85
Battery Charging Station	$75
Rechargable Nicad Battery	$16

Keyboards

Apple Keyboard II	$75
Apple Extended Keyboard II	$160
Apple Adjustable Keyboard	$130

We have Intl Keyboards!

Great Stuff

Turbo Mouse	$105
Apple Power Speakers	$140
Seagate ST3600N Ext. 500MB	$CALL

CIRCLE 438 ON READER SERVICE CARD

Other World Computing

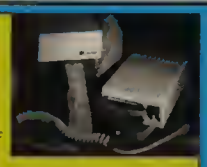
(800) 275-4576
Internat'l (815) 338-8658
Fax (815) 338-4332
224 West Judd St.
Woodstock, Illinois 60098

We Will Meet or Beat any Nationally Advertised Price!

SCHOOL, GOVERNMENT AND CORPORATE POs ACCEPTED!

VISA

Hard Drives



We offer both external and internal hard drives specifically for the Macintosh Computer. All drives include

- 30mb of ShareWare and FreeWare
- System 7.1 installed
- All necessary cabling
- Anubis award winning SCSI Formatting Utility
- Internal drives also include the necessary mounting and connecting hardware

30-Day Money Back Guarantee
2 Year Warranty on Drives From 42-340mb
5 Year Warranty on Drives From 540-1800mb

Quantum	Internal / Ext.
42mb	$99 / $149
170mb	$189 / $239
270mb	$289 / $319
340mb	$329 / $359
540mb	$579 / $529
1080mb	$819 / $859
1800mb	$1,039 / $1,089

SIMMS

Simms as low as $29

Powerbook Memory starting at $69

Give us a call for the best pricing on 1,2,4,8,16 and 32 meg SIMM modules for all Macs and 2, 4, 6, 10mb. and 2-20 meg modules for PowerBooks and Duos

All memory from OWC is covered by a LIFE-TIME WARRANTY!

PowerBook Expansion

Quantum GLS 170mb. Drive.....$289
Quantum GLS 256mb. Drive.....$359
PB 2.5" AC Power Case.....$59

Supra

FaxModem v.32bis 14.4bps.....$259

2.5" PB Drives Have a 1 Year Warranty!

Applied Engineering

TransWarp 4300 Series Accelerator for the Macintosh LC, LCIII, Performa 400, and Color Classic

40Mhz 030 w/ 128k Cache - $369
40Mhz 030 w/ 128k Cache - $509

TransWarp 6440F Series Accelerator for the Macintosh IIsi, IIci, IIvx, IIvi and Performa 600

Special

40Mhz 040 w/ FPU $979

NEW!KS Labs Alacrity CPU Boosters

Increases CPU and Graphics speed of your Centris 610, Centris or Quadra 660av, Quadra 650, and Quadra 800 by as much as 40%. No soldering or special skills required and the Alacrity Boosters are easily removable.

Only for C610, C-Q660av, Q650, Q800 $159

This Months Specials!

NCD OCR Scanner $79
Lets you take printed text directly into the Mac. Text only.

Mass Micro QI-24 24-bit Nubus Video Capture Card
The QuickImage 24 card allows you to preview and capture 24-bit color or 8-bit grayscale images from a wide range of NTSC or PAL video input sources, including camcorders, VCRs, videodisc, and still video cameras via the built in composite and S-Video inputs. QI-24 can capture 24-30 Frames Per Second. The QI-24s QuickTime Compatible and System 7 Savvy.

$65 with any other purchase $79 purchased separately

Call for the best pricing on the new Power Macintosh Systems and PowerPC Macintosh Upgrades!

CIRCLE 553 ON READER SERVICE CARD

Macworld SHOPPER®

Inventory Reduction!!

Duo Dock (no floppy).....$199.
SE 1/20 .....249.
LCII 2/40 .....399.
IIsi 3/40 (new).....449.
PowerBook 100 2/20 .....499.
PowerBook 140 2/20 .....599.
Mac II 0/0 .....279.
Personal L'writer LS .....349.
Apple 14" Trinitron.....299.

Quantities are very limited and items will be sold on a first come first sold basis. CPUs are without keyboard.

17" Multi-Res Color Monitor by Lite-On

High quality monitor displays 640x480, 832x624 and 1024x768, .26 dot pitch. Includes tilt-swivel base and interconnect cable.

Blow-Out Price!!

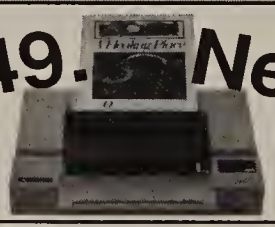
$549.

8-bit Nubus video board for Lite-On.....$199.

Printers

Imagewriter I .....$169.
Imagewriter I w/c.....229.
Imagewriter II .....299.
Imagewriter LQ .....449.
Personal L'writer LS.....349.
Personal L'writer NT.....649.
Laserwriter II engine (NEW).....699.
Laserwriter IInt.....799.
Laserwriter IIntx.....999.

$549. New!



Apple Color Printer- 360 dpi, up to 11" x 17"

Used CPU's

Mac IIcx 0/0 .....$599.
Mac Plus.....299.
Classic 4/40.....499.
Classic II 4/40.....599.

Radius Monitors

Monochrome Pivot.....299.
Color Pivot(anti-glare) .....599.
Color Display/21 .....1499.

Monitors

Apple 12" mono .....$149.
Apple Basic Color.....129.
Apple 12" color .....169.
Performa Plus (NEW).. .....299.
Apple Portrait.....399.
Seiko CM1445 (NEW).....449.
Apple 16" color (NEW) .....899.
(prices with purchase of CPU)



LC 2/40.
Includes Apple Basic color, keyboard, & mouse.

Parts

Logic Boards
Floppy Drives
Hard Drives
Power Supplies
Imagewriter Parts
Laserwriter Parts
Cases
Portable Parts
PowerBook Parts

EXPRESS ORDERS ARE OUR SPECIALTY!!

Upgrades

Mac 512kE to Plus .....$99.
Mac SE FDHD ROM & Drive.....329.
Mac IIcx to IIci .....499.
Mac SE to SE-30 logic board .....399.
Mac II to IIfx .....1299.
Mac II FDHD (ROM only) .....249.
IIci to Quadra 650.....1399.

Personal L'writer NTR logic upgrade!!.....$299.

Misc. Specials!

CD-SC w/Wayzanta "Fun House".....$149.
SE Power Supply.....99.
LC Power Supply & case.....179.
20-Meg External Hard Dr.....89.
SE-Analog Bd.....129.
1.44 FDHD floppy mech.....199.
ADB Extended Keyboard (3rd Party).....79.
40-Meg Tape Back-up .....129.
LaserWriter Plus ROM upgrade.....99.
PowerBook 140/170 Battery .....49.
12" Monochrome monitor.....169.
LC Logic bd.....99.
Mac IIsi Power Supply & Case .....149.
ADB Mouse.....49.
40-Meg internal for Mac Portable .....149.
800k External Floppy .....110.
5.25 External PC Drive .....25.
IIcx/IIci/Quadra/IIxv Power Supply.....149.
Portable Battery Recharger .....49.
2.5 20-Meg PowerBook Drive mech.....39.
1200 Baud Personal Modem w/cable .....29.
40-Meg 5.25 (Internal Mac II/IIx/IIfx).....49.
Nubus Black & White Video bd.....49.
LC Ethernet Board.....49.
CRT & Yoke Assy. (Plus & SE) .....29.
IIsi Case.....29.
Mac Plus Keyboard.....59.
20-Meg Internal Hard Dr.....49.
Portable 2400 Baud Internal Modem .....99.
40-Meg External Hard Drive .....139.
Case & Power Supply-Mac II/IIx/IIfx .....199.
Classic Power Supply .....99.
Personal NT Logic Bd.....179.
Mac Portable Numeric Keypad.....29.
8-Bit Video Bd (nubus).....149.
Personal SC Logic Board .....29.
SuperMac S'view (p'book video i'face) .....199.
IIcx case & power supply.....199.
Classic Logic bd.....129.
CRT & Yoke Assy.....49.
Mouse (Mac Plus).....59.
IIfx 1-Meg SIMMS.....29.
IIvx Case.....129.
Plus Power Supply .....119.
StyleWriter AC adaptor .....49.





IIvx 4/230 *Brand New*
(keyboard/monitor extra)
IIvx 4/0.....$779.

Equipment is used or demo otherwise stated. Equipment carries a 120-day warranty. Returns subject to a 15% restocking fee. Prices subject to change. Prices represent "2% cash discount" off full price.

We Buy Macs! Call 318-424-9791

Shreve Systems

1200 Marshall St Shreveport La 71101
FAX 318-424-9771 Tech. 318-424-7987

800-227-3971

CIRCLE 425 ON READER SERVICE CARD

SOMETHING FOR NOTHING



Free Catalog Of Used Macintosh Computers and Peripherals

While Mac outfits come and go, we just keep on doing what we do best. We've been refurbishing and selling used computers for 11 years. *Your satisfaction is guaranteed with us!*

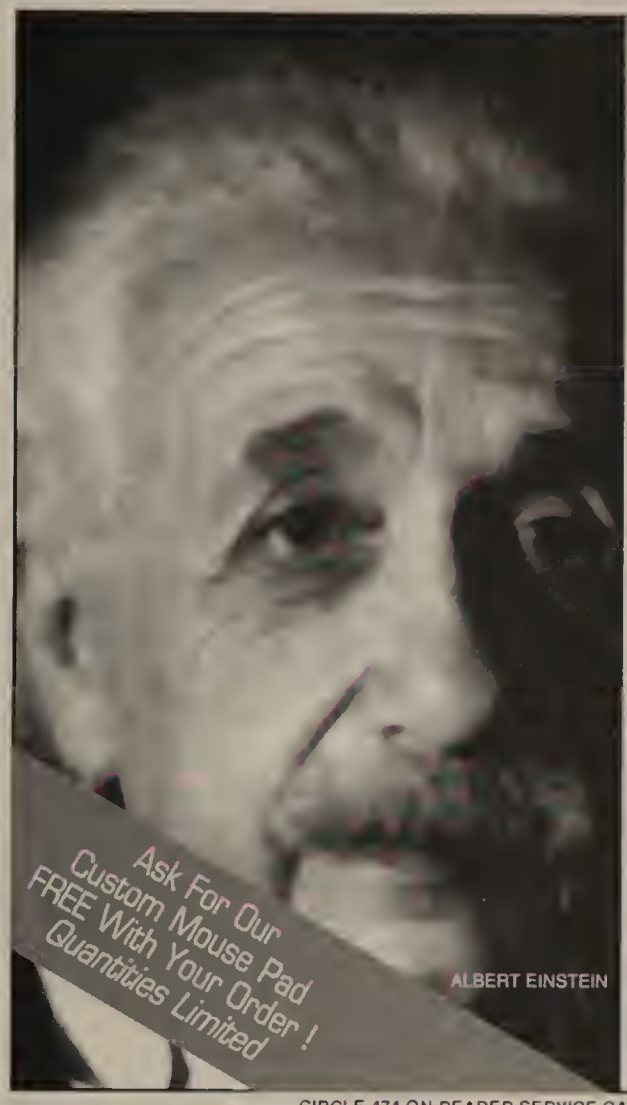
1-800-821-3221

Call Anytime!

PO Box 4059
Logan, UT 84323-4059
International (801) 755-3360
Fax: (801) 755-3311

Sun Remarketing, Inc.

CIRCLE 424 ON READER SERVICE CARD



Macintosh has changed the world too!... Again!...Call 1 800 275-9924 today... for all your Mac & PowerPC needs! Our prices will ROCK your world!

MACINTOSH & PC's
HARDWARE,
SOFTWARE, TRAINING,
SERVICE & SUPPORT
& LEASING

C.R.I. SYSTEMS

331 DANTE CT.
HOLBROOK NY 11741
IN NY CALL .516 737-0800
FAX 737-0923

CRI COMPUTER SYSTEMS

POWERPC IS HERE !

CIRCLE 474 ON READER SERVICE CARD

W E BEAT ANY PRICE!

MAC TALK

CPU's:
POWER PC & POWER PC Upgrades
Quadras & Powerbooks
All models available
DISPLAYS: Apple, SuperMac, NEC, RasterOps, Radius, Sony and others.
SCANNERS: Microtek, Umax, HP, Sharp & More.
PRINTERS: Apple, HP, NewGen, GCC.
MODEMS: Global Village
DEALERS AND INTERNATIONAL SALES WELCOME!

800-622-5557

(818)880-6116
FAX
(818)880-6103
22941 Ventura Blvd., Suite H991
Woodland Hills, CA 91364

CIRCLE 540 ON READER SERVICE CARD

QUADRA

Work Group Servers
60/80/95 --- In Stock CALL
950 8/0 ---------- 2749
950 8/525 ---------- 3199
950 8/1GB ---------- 3549
840 av 8/230 ---------- 2879
840 av 16/500 CD -- 3649
840 av 16/1GB CD -- 4100
800 8/230 ---------- 2199
800 8/500 ---------- 2549
800 8/500 CD ---------- 2899
800 8/1GB CD ---------- 3298
660 av 8/230 ---------- 1595
660 av 8/230 CD ---- 1849
660 av 8/500 CD ---- 2200
650 8/230 ---------- 1949
650 8/230 CD ---------- 2229
650 8/500 CD ---------- 2579
610 8/160 ---------- 1319
610 8/230 ---------- 1599
610 8/230 CD ---------- 1899
605 4/80 ---------- 919
605 8/230 ---------- 1249

CENTRIS

610 4/80 ---------- 875
610 4/80 W/Eth. -------- 965
610 8/230 W/CD ----- 1549

IISI 3/40, 80 ------ 449/495
IIVX 4/80, 230 -------- CALL

Apple Spare Parts In Stock!

POWERBOOKS

145 B 4/40, 80 - 1095/1165
160 4/80, 200 - 1350/1550
165 4/80, 160 - 1455/1695
180 4/80, 160 -- 1850/2099
180/180C 14/340 -- 2599/2699
180C 4/80,160 2150/2395
180C 4/240,340 2599/2699
Duo 210 4/40 ---------- 899
" 230 4/40, 80 1099/1199
Duo 230 4/200 ---------- 1449
Duo 250 4/80 ---------- 1595
Duo 250 4/200 ---------- 1745
Duo 270 c 4/240 -------- 2595
" 12/240 W/ Modem 3089
Duo Dock w/230 HD ------ 595
FPU/ VRAM ---------- 39/49
Express Modem ---------- 199
MEMORY UPGRADE'S CALL

PB. Hard Drives

40/80MB HD -------- 69/145
120/160MB HD --- 195/285
250/340MB HD --- 335/495
525MB HD 2.5" -------- CALL
Pocket Size External Case
For Above Drives ---------- 65

WACOM

ARTZARTZ Bundle 284/489
12x12 UD+Painter ------ 699

Pinnacle Micro

1.3 GB Optical --------- 2699

SPECIALS

NEW PowerPC In Stock! NEW

CALL for UNBEATABLE prices!

- ★ APPLE Color Printer___ $495
- ★ LaserWriter Select 310 $655
- ★ PowerBook DUO 250 4/80, 200MB __ $1495/1695
- ★ APPLE DUO DOCK___ $345
- ★ Removable Hard Disk Cartridge 44/88MB _____ $59/79

PLI

Infinity270 ____ 629
Infinity105 ____ 529
Infinity88C ____ 449
10 GB DAT ___ 1399
128 Optical __ 1025
650 Optical __ 1399
1.3 GB II Opt._ 3199
2GB Array ___ 2799

NEWGEN

ImagePlus 12 _CALL
ImagePlus 6 __ 3995
Turbo PS 1200/B 4545
Turbo PS 880/B _CALL

UMAX

UC630LE ____ $649
UC840 _____ $929
UC1200 _____ $1199
UC1200SE __ $2799

We Buy Excess Inventory & Accept Trade-ins!

INTERNATIONAL SHIPPING AVAILABLE

Printers & Scanners

Pro 600 110/220V. -- 1399
Pro 630 110/220V. -- 1889
Pro 810 800dpi ------- 4390
Select 360 ---------- 1499
Select 320 ---------- 899
LASER IIF/Board -- 875/295
HP LaserJet 4ML -------- 945
HP LaserJet 4MP ------ 1345
HP 4M/220V --- 1845/1985
HP 4SI MX ---------- 4250
DeskWriter 500 ---------- 295
" 500C/550C ---- 369/485
" 300/310 -------- 285/325
DeskJet 1200C/PS. -- 1895
PaintJet XL300 PS. --- 3150
ScanJet IIC/IICX -- 695/945
ScanMaker II/IIXE 675/995
220 Volt Printers Available

MONITORS & CD ROM Drives

CD 150i/300i ------- 99/309
CD 150/300 Ext. - 149/349
21" COLOR Display --- 2399
16"/14" RGB ------- 979/429
AudioVision 14" ---------- 665
14" Clr. Plus/Basic - 289/199
12" COLOR RGB -------- 195
NEC 3FGX ---------- 529
NEC 4FG/5FG ---- 595/1099
" 5FGP/6FGP 1199/2299
SONY 1730 SE --------- 1149
SONY 2036 ---------- 1949

MONITORS & CARDS

RasterOps

Horizon 24 W/DSP ---- CALL
MoviePak 2 ---------- 1549
MoviePak Presenter -- 1399
24XLTV ---------- 2399

radius

Radius 21" Color ------ 1799
Precision Clr. 20V ----- 1749
Precision Clr. 17 ------ 1219
VideoVision Studio ---- 3399
Precision Pro24X ------ 1399
IntelliColor 20i --------- 2349

SUPERMAC Full Line Dealer

Thunder Light ---------- 999
Thunder 24 V 2.0 -------- 1575
Spectrum 24 PDQ+ -------- 949
Spectrum 24 Ser.IV ------ 749
Spectrum Power --------- 1109
17T Trinitron -- 969
20" Plus Color ---------- 1539
20-TXL Multimode -------- 1929
20" Hi-Res Trinitron --- 2525
21" Two-Page Clr. ------- 1999
20" Gray Scale ---------- 749
21" Gray Scale ---------- 949
T-16 MR ---------- 1119
Futura SX/MX ----- 199/425
" II/Ultra LX ---- 729/1019

COMPU.D INTERNATIONAL INC

Orders 1-800- 929-9333

Sales (818) 787-3282 — All prices reflect C.O.D. order only & are subject to change! — Fax (818) 787-5555

MAC SOFTWARE Available With Best Prices!

CIRCLE 541 ON READER SERVICE CARD

SYSTEMS & PERIPHERALS
UPGRADES & MEMORY

Macworld SHOPPER®

EXTERNAL DRIVE HOUSINGS

Full Height	145.00
Half Height	89.00
3.5" Mini Housing	89.00
2.5" Pocket Housing	89.00

- Closed or Open Front Bezel
- Includes FWB Software & all necessary cables.
- 110/220 VAC Auto Switching Power Supply
- Full Height Cabinet will hold (2) 3.5" or (2) 5.25" HH Drives

DATAMAX
26212 Dimension Dr. #220
Lake Forest, Ca 92530

800-321-4962
Int'l 714-586-9907
Fax 714-586-6959

MC,VISA,AMEX. GOVT. & UNIVERSITY P.O.'S WELCOME

CIRCLE 552 ON READER SERVICE CARD

SALE!! CLOSE OUT PRICES!!

Apple Performa display: 14" VGA, .39 dot pitch, 640 x 480, tilt and swivel base, brand new, 1 year Apple warranty. Only $149.95...10 PCS+ $129.95

Apple Workgroup Server 95: PDS card upgrade kit. New, bulk pack, warranty. Upgrade Quadra 900, 950 to Apple Work Group Server, 512K $99.95...128K $699.95

PC/PC Computer Liquidators
1650 Mansfield St.
Santa Cruz, CA 95062
Call: 408-464-2667
Fax: 408-464-2800

Your Desktop Publishing Multi-Media Video-CD Production Source

1-800-429-7779
Fax: (714) 375-6397
Voice: (714) 375-6390

MacCare INCORPORATED

Prices Are Subject To Change Without Prior Notice

MACINTOSH

PPC 6100/60 8/250 CD	$2150
PPC 6100/60AV 8/250CD	$2375
PPC 7100/66 8/250	$2650
PPC 7100/66 AV 8/500CD	$3895
PPC 8100/80 8/250CD	$3995
Quadra 950 8/230	$2750
Quadra 800 8/230	$2350
Quadra 800 16/1G	$3250
Quadra 840av 8/525	$2950
Quadra 840av 8/1G	$3350
Quadra 650 8/230	$1840
Quadra 650 8/500	$2090
Quadra 660av 8/230	$1575
Quadra 610 8/230	$1588
Quadra 605 4/80	$857
POWER BOOK 180C 4/80	$2149
POWER BOOK 165C 4/80	$1549
DUO 270 4/240 EXPRESS M	$2899

MULTI-MEDIA

Sony 900E Recorder	$Call
Phillips CD Rom Recorder	$5995
Media Pro 100	$Call
SONY BETA CAM UVW 1800	$Call
RADIUS VIDEO VISION	$2975
Sony V-Deck	$1695
RasterOps Media Time	$1575
Call For Any Multi-Media Product!!!!!!	

FILM RECORDERS/ NETWORKING

AGFA PCR II	$Call
Polaroid CI5000	$5250
JVC KY-F30U	$Call
Tele Video Conferencing Plug & Play	
Pier to Pier Communication	$3795

PRINT PRODUCTION

Laserwriter Pro 600 8m	$1495
Kodak Color Ease	$6495
QMS Color Script (Wax)	$2895
Data Products 11x17	$3650
Dye-Sub Printers	$Call

CIRCLE 437 ON READER SERVICE CARD

DataCarts for Syquest Drives

Lifetime Warranty
Money Back Guarantee
Special Offer

DataCart 45
1 Pack ..... $58.
5 Pack ..... $55.

DataCart 88
1 Pack ..... $89.
5 Pack ..... $86.

Komag Optical Disks

128MB ..... $29.
600MB ..... $85.
1GB ..... $102.

Memory Merchants
Quality Removable Storage
(800) 799-DISK
(3475)
4 Shratton Ave., San Carlos, CA

CIRCLE 539 ON READER SERVICE CARD



Quadra/Power Mac		POWERBOOKS/ DUO		DEMO UNITS	
8100 AV	CALL	180C 4-80	CALL	Q700	1340
8100 16-500	4690	180C 14-235	2970	Q800	STOCK
8100 8-230	CALL	180 10-160	2465	Q900	1489
7100 8-0	2530	180 8-340	2645	II SI	395
7100AV 8-5003565		165C 4-80	1689	IIG/IIF	STOCK
6100 8-500 CD2390		165C 4-250	1980	PB 170	1090
6100 8-230	2195	165 4-80	1645	PB 180	CALL
Q840 16-1GB	CALL	DUO 270C	CALL	**MORE DEMO UNITS IN STOCK**	
Q840 0-0	2490	270 12-240	3190	PB 140	815
Q650	1895	250 4-200	2485	14" MONITOR	CALL
950	CALL	250 +MODM	CALL	CTR 650/660	CALL
900	STOCK	230 4-80	CALL		

TRADE & UPGRADE	
700/900-840	180
Q800 to Q840	1149
FX to Q660	1345
LC III upgrade	CALL
PB 140 to 180	CALL
PB 170 to180	990
PB 160 to165	790

LOGIC BOARDS	
Q-840 AV	CALL
660 AV	1385
IIF/IIG	CALL

SCANNERS	
NIKON	CALL
AGFA	2980
UMAX 1260	1790.
MICROTEK	STOCK.

PRINTER	
NEWGEN	CALL
HP4ML	990
HP 4	CALL

MONITOR	
NEC 4FGE	679
NEC 5FGE	CALL

PARTS !!! *Special Upgrade*

POWER SUPPLY	LC, LCII, LCIII to
FLOPPY DRIVE	Preforma 460 33 mhz
HARD DRIVE	$385
IN STOCK	Centris 610 $989

WE SELL: *NEW MACS, PRE-OWNED MACS AND PARTS!*
PLUS MONITORS, SCANNERS, PRINTERS, MODEMS & MORE

CALL NOW DON'T DELAY

INTERNATIONAL COMPUTER & NETWORKING
FON 310-441-9181 ■ FAX 310-479-0124
10835 SANTA MONICA BLVD., SUITE 102, LOS ANGELES, CA 90025

CIRCLE 439 ON READER SERVICE CARD



INCREASE YOUR VISIBILITY

Macworld Shopper section offers a great

FOUR COLOR

format to bring your ad to life.

DIGITAL ECLIPSE ORDER TODAY 1-800-289-3374

ACCELERATE YOUR POWERBOOK

NEW! X-SERIES



"Very impressed" ★★★★ –MacWorld Magazine, *Dec 93*

All of our upgrades come with a full one year warranty.

OUR NEW X-SERIES ACCELERATORS ARE DO-IT-YOURSELF POWERBOOK UPGRADES. NO POWERBOOK SHIPPING REQUIRED.

25MHz

F/25X™ FOR THE POWERBOOK 140&145

78% performance boost! Upgrades your CPU from 16 to 25 MHz and installs a Motorola 25MHz FPU to give you the power of a PowerBook 170. Logic board swap.

$329

33MHz

F/33X™ FOR THE POWERBOOK 160&165

54% performance boost! Upgrades your CPU from 25 to 33 MHz and installs a Motorola 33MHz FPU to give you the power of a PowerBook 180. Logic board swap.

$349

ASK ABOUT OUR UPGRADES FOR OTHER POWERBOOKS, MEMORY, HARD DRIVES AND REPAIRS ★ 5515 DOYLE ST N° 1 EMERYVILLE CA 94608 510.547.6101 ★ 510.547.6104 FAX

CIRCLE 576 ON READER SERVICE CARD

MAC Xtra! Delivering The Knockout Punch On High Prices!

POW! MEMORY UPGRADES

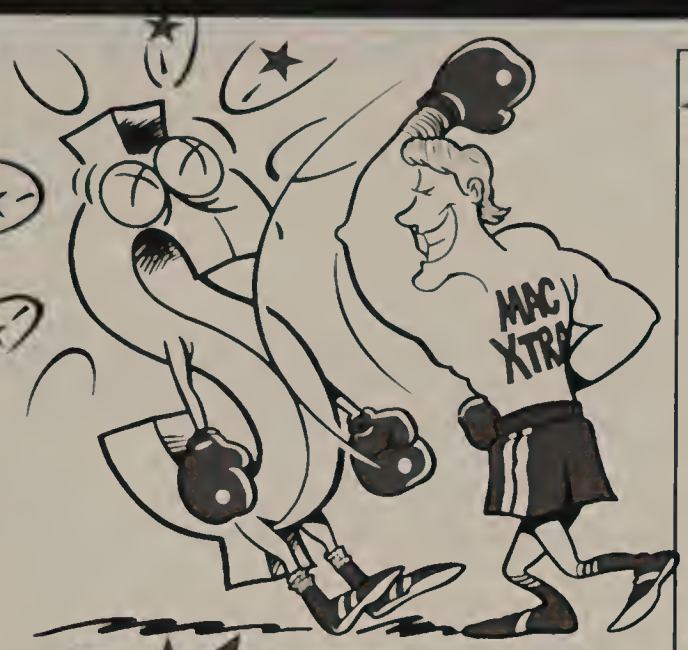
1x8x80	$40
2x8x80	$73
4x8x80	$148
4x8x80 II/IIx	$155
16x8x70 (Low Profile)	$619
1x8x80fx	$42
4x8x80fx	$150
16x8x80fx	$621
4MB 72 pin (70NS/60NS)	$139/$147
8MB 72 pin (70NS/60NS)	$296/$299
16MB 72 pin (70NS/60NS)	$615/$625
32MB 72 pin (60NS)	$1,305
Newton-2MB	$289

POP! POWERBOOK MEMORY

PB 100-6MB	$265
PB 140/170-4MB/6MB	$165/$259
PB 160/180-4MB/6MB	$165/$255
PB 160/180-8MB/10MB	$325/$415
PB 165C/180C-4MB/6MB	$165/$269
PB 165C-8MB/10MB	$335/$439
PBDUO 210/230-4MB/6MB	$165/$215
PBDUO 210/230-8MB/10MB	$299/$349
PBDUO 210/230-12MB/20MB	$572/$969
PBDUO 210/230-28MB	$1,685

WHAM! MODEMS

Supra 5014LC 14.4 S/R Fax	$165
Supra 2400	$59
SupraV.32bis Powerbook Fax	$229
Supra 14.4 S/R Fax (w/cable/software)	$225
Zoom AMX 2400 bps	$68
Zoom FXV 2400/9600 S/R Fax	$129
ZoomVFXV 14.4 v.32bis S/R	$195



SOK! ACCELERATORS

DAYSTAR Universal Powercache

030 33/33 w/FPU	$289/$379
030 50/50 w/FPU	$439/$565
Turbo 040 25/33	$779/$949
Turbo 040 40	$1,129
128K Cache for Turbo 040 Accelerators	$172

APPLIED ENGINEERING

SE 25 mhz/ 25 mhz w-FPU	$189/$289
Classic 25 mhz/25 mhz w- FPU	$189/$289

POW! DRIVES

Rumi 1.2 Ext/Rumi 1.2 Int	$1,109/$1,089
Rumi 170 Ext/Rumi 170 Int	$299/219
Rumi 85 Ext/Rumi 85 Int	$279/$209
Rumi 240 Ext/Rumi 240 Int	$349/279
Rumi 525 Ext/Rumi 525 Int	$699/$609
Rumi CD-ROM	$299
Rumi Optical 128 MB w/5 cartridges	$995
Rumi 44MB SyQuest w/cartridge	$289
Rumi 88MB SyQuest w/cartridge	$469
Rumi 105MB/C SyQuest w/cartridge	$445
Rumi 2GB DAT Drive	$1069
Rumi 8GB DAT Drive	$1219

POW! MISCELLANEOUS

256K / 512K VRAM	$20/$38
Tool Kit (Simms Inst. Kit)	$7
PowerBook Tool Kit	$6.50
SIMMdoubler/SIMMchanger	$137/$98
LC/ LC II FPU	$55
LC III FPU	$65
Classic II FPU/Color Classic FPU	$55/$48
Duo Dock/Performa 600 FPU	$59
Centris FPU	$315
TI Microlaser Upgrade	$54
HP 4MB/HP 8MB	$175/$355

POP! SYQUEST CARTRIDGES

SyQuest 44MB Cartridge	$59
SyQuest 44MB Preformatted	$64
SyQuest 88MB Cartridge	$93
SyQuest 88MB Preformatted	$98
SyQuest 105MB Cartridge	$79

SOK! MEDIA

Optical Cartridges

128 MB (Samsung)	$34
650 MB (Samsung)	$85
1.2GB/512K (Verbatim)	$112
1.3GB/1024K (Verbatim)	$112

Bernoulli Cartridges

44 MB	$97
90 MB	$105
150 MB (5 Pack)	$459

WHAM! SHIPPING

Overnight Delivery	$7
UPS	$6

International Orders–24 Hours a Day

Phone:	(206) 455-0786
Fax:	(206) 455-3448



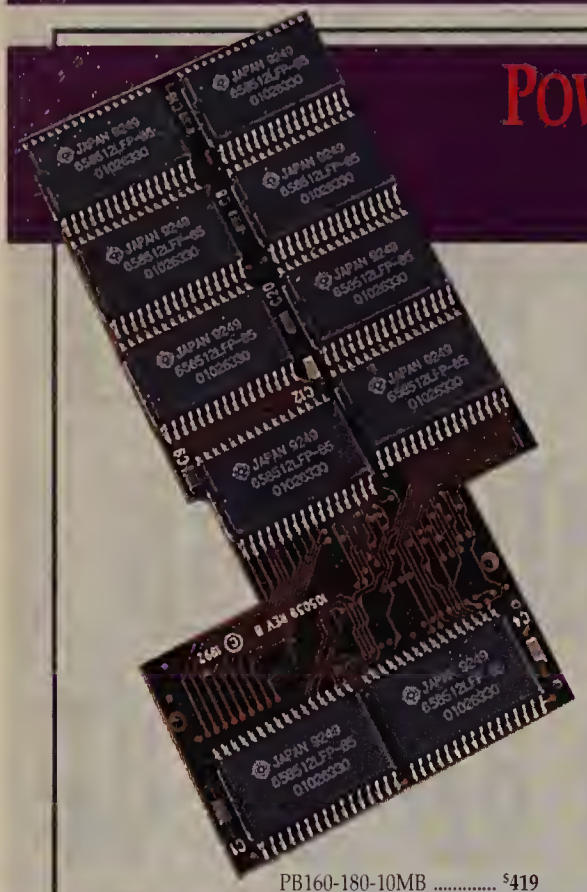
MAC Xtra
1075 Bellevue Way N.E. Suite 114,
Bellevue, WA 98004
Phone: (206) 455-0786
Fax: (206) 455-3448

We accept MasterCard, VISA & Discover •
Returns subject to approval and restocking fee•
Prices subject to change
7:00 AM to 6:00 PM M-F 9:00 AM to 4:00 PM Sat. PST

CALL: 1-800-553-4230

CIRCLE 561 ON READER SERVICE CARD

INTRODUCING MEMORY



PB160-180-10MB $419

POWERBOOK MEMORY AS LOW AS $169

PB140-170-4/6	$169 / $259
PB160-180-4/6/8/10	$169 / $259 / $329 / $419
PB165C-180C-4/6/8/10	$169 / $272 / $332 / $442
DUO 4/6/8/10	$169 / $219 / $305 / $355
DUO 12/14/20/28	$575 / $649 /$975 / $1692

ACCESSORIES

Battery Charger - Battery 140-180 Bundle	$125
Long Life Battery 140-180c	$59
Automobile Adapter 100-180 / DUO	$58 / $69
Newer Technology DUO Micro Dock SCSI / Color	$135 / $259
Axion Switch-3 Serial Ports	$95
Keytronic Keyboard / KensingtonTurbo Mouse 4.0	$129 / $106
Wacom ARTZ	$305

SCANNERS / PRINTERS

HP IICX	$999
UMAX UC630 LE	$729
Microtek ScanMaker IIXE	$1079
Citizen Notebook II Color Printer	$378
GCC Write Impact	$549
LaserWriter 810 4MB / 8MB Memory	$259 / $459
HP Printer Memory 4MB / 8MB	$179 / $359

MEMORY

1x8x80	$40
1x8x100	$39
1x8x80 (fx)	$57
2x8x80	$73
4x8x80	$149
4x8x80 (fx)	$150
4x8x80 (II,IIx)	$155
16x8x80 (Low Profile)	$625
16x8x80 (fx)	$619

CENTRIS-LC III-QUADRA

4MB-70ns / 4MB-60ns	$147 / $153
8MB-70ns / 8MB-60ns	$297 $309
16MB-70ns non-composite	$629
16MB-60ns non-composite	$629
32MB-60ns	$1275

VIDEO RAM / MATH COPROCESSORS

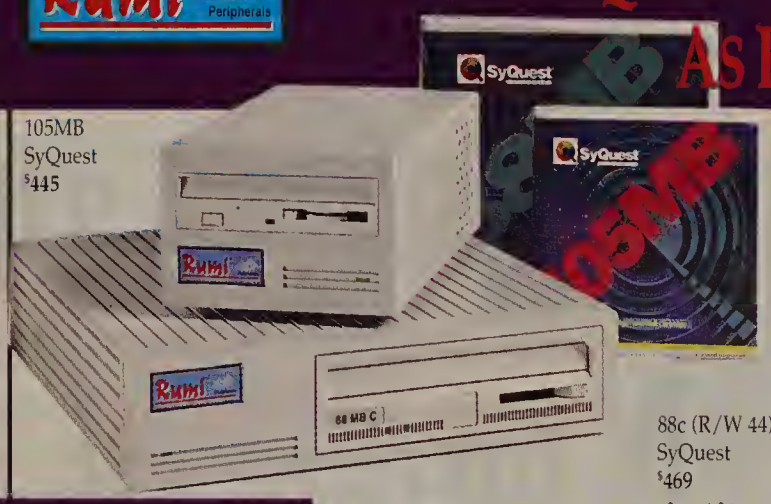
Video RAM 256K / 512K	$20 / $38
16MHz LC / Classic II	$59
16MHz Color Classic	$49
25MHz LC III	$69
35MHz Performa 600 / Duo Dock FPU	$65
Centris FPU	$319



MicroMac SIMMdoubler	$137
MicroMac SIMMchanger	$98

Ask about our Lifetime Warranty on all our memory products. Prices and availablity are subject to change.

RUMI SYQUEST DRIVES AS LOW AS $289



105MB SyQuest $445

88c (R/W 44) SyQuest $469

Includes FREE Cartridge from SyQuest!

RUMI SYQUEST DRIVES

Rumi 44MB SyQuest	$289
Rumi 88c (R/W 44) SyQuest	$469
Rumi 105MB SyQuest	$445
Rumi 85MB Int / Ext	$209 / $279
Rumi 170MB Int / Ext	$219 / $299
Rumi 270MB Int / Ext	$299 / $369
Rumi 525MB Int / Ext	$639 / $699
Rumi 1.0GB Int / Ext	$879 / $939
Rumi 1.2GB Int / Ext	$1089 / $1109
Rumi 2.0GB Barracuda Ext	$2269

SYQUEST $59

SyQuest 44MB Cartridge/Formatted	$59 / $65
SyQuest 88MB Cartridge/Formatted	$94 / $99
SyQuest 105MB Cartridge	$80

RUMI DAT DRIVES Includes Tape*

Rumi 2.0GB DAT Drive w/Retrospect*	$1069
Rumi 8.0GB DAT Drive w/Retrospect*	$1219

RUMI CD-ROM DRIVE . $299

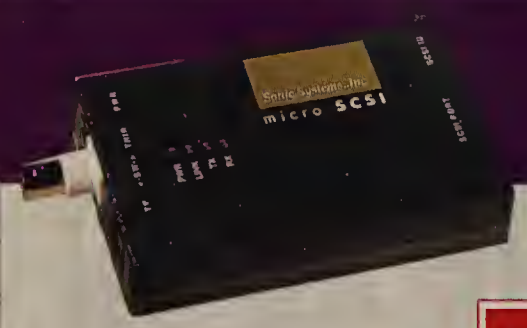
RUMI OPTICAL DRIVE

Includes 5 Verbatim Cartridges
Rumi 128MB Optical Drive $995

MORE DRIVES Includes Disk*

PLI Infinity 44*	$355
PLI Infinity 88 R/W 44*	$515
PLI Infinity 105 Turbo*	$535
PLI CD-ROM Int / Ext	$509 / $559
PLI 128MB 3.5" Optical (Sony Mech)*	$1219
PLI 128MB 3.5" Optical (IBM Mech)*	$949
PMO Sierra 1.3GB Optical	$2879
FWB SCSI JackHammer	$649
FWB HardDisk ToolKit	$159
FWB CD-ROM ToolKit	$69

SONIC AS LOW AS $89



Sonic Micro SCSI PowerBook... $235

Sonic Ether 10T/Thin-II/LC	$89
Sonic Micro SCSI PowerBook	$235
Sonic FriendlyNet 10T/Thin	$49
Sonic Starbase T9	$195
Sonic HubLite 5 port	$145
Sonic PowerBridge	$95

MODEMS



Supra v.32bis S/R Fax 14.4 w/ C & S	$225
Supra v.32bis S/R Fax 14.4 LC w/ C & S	$165
Supra 2400 Modem ONLY	$59
Supra 2400 Modem S/R Fax 9600 w/ C & S	$139
Supra v.32bis PowerBook 14.4	$229
Global Village Teleport / Powerport (Bronze) 24/96/48	$97
Global Village Teleport / Powerport (Gold) 14,400	$299
Global Village Teleport / Powerport (Mercury) 19,200	$329
U.S. Robotics Sportster 14.4 S/R Fax	$237
Prometheus PowerBook 14.4 w/Voice	$309
Zoom Pocket 14.4 w/Voice	$239
Zoom 14.4 w/Voice	$189

FAX
206-454-7302

Educational/Government
1-800-848-1424

Fortune 1000 Companies
1-800-848-1418

CIRCLE 563 ON READER SERVICE CARD

AT PRICES YOU WON'T FORGET



40MHz Turbo 040
$1129

* Buy eligible 040 products between 1/7/94 and 3/31/94 and receive a PowerPC upgrade for only $199!

TURBO 040 ACCELERATORS AS LOW AS $609

Excellent MacWEEK

40MHz Turbo 040 / with cache	$1129 / $1209
33MHz Turbo 040 / with cache	$949 / $1039
25MHz Turbo 040	$779
040i 20MHz Turbo (No FPU)	$609
040i 25MHz Turbo (No FPU)	$695
040i 33MHz Turbo (No FPU)	$779
128k Cache for Turbo 040's	$172
Value 040i 33MHz (No FPU)	$779
Value 040 33MHz	$949
Value 040 40MHz	$1129

CENTRIS & QUADRA 040 ACCELERATORS

Image 040 40MHz	$1899
Quadra 040 40MHz	$1299



50MHz 030 w/ FPU $565

UNIVERSAL POWERCACHE 68030

UPGRADABLE TO TURBO 040

33MHz / 33MHz with FPU	$289 / $379
50MHz / 50MHz with FPU	$439 / $565
33MHz Powercache SE/Classic w/ video & adapter	$779
50MHz Powercache SE/Classic w/ video & adapter	$909

MORE DAYSTAR PRODUCTS

Quadra Cache	$249
Adapter IISI NUBUS	$389
Charger	$505
Charger Plus w/ Suites	$649
Photomatic	NEW! $199

DAYSTAR DIGITAL

VERBATIM AS LOW AS $23



CD-Recordable 640/74Min. $23

128MB 3.5" Optical	$34
128MB 3.5" Optical, Apple Format	$36
600 / 650MB 5.25" Optical (512 b/s / 1024 b/s)	$85
1.2 / 1.3GB Optical (512 b/s / 1024 b/s)	$112
CD - Recordable 640 / 74 min	$23
DC2120 w/QIC80	$19.50
4mm 90m / 60m	$11.50 / $8.90
8mm 112m	$10

SONY MEDIA

1.3 / 1.2GB Optical	$135
650 / 600MB Optical	$109
128MB 3.5" Optical	$46

SONY 3.5" DISKS

3.5" DD/3.5" Color / Hard Case	$7.50 / $14
3.5" HD/HD Mac Formatted	$12 / $13.50

SONY 1/4" DATA CARTRIDGES

1/4" Mini D/C 120MB / 150MB / 250MB	$18 / $20 / $26
1/4" Mini QIC-80 120MB Formatted	$23
1/4" D/C 525MB	$30
1/4" D/C 2.65GB	$49



SONY PCMCIA CARDS

SRAM Card 1MB / 2MB	$225 / $369
Flash Card 2MB / 4MB	$269 / $469

SONY CD-R

650MB/74 Min.	$25
553MB/63 Min.	$23

SONY 4mm DAT

4MM 60M 1.3GB	$13
4MM 90M 2GB	$15
4MM 120M 4GB	$24
Cleaning Cartridge	$12.50

SONY 8mm DAT

8MM 15M 600MB	$12
8MM 54M 2.4GB	$14
8MM 112M 5GB	$16
Cleaning Cartridge	$28

RASTEROPS MONITORS AS LOW AS $949



RASTEROPS
THE ART & SCIENCE OF COLOR

DUO DOCKS

Duo Mate 8	$349
Duo Mate 16SC	$559

MONITORS / VIDEO

PaintBoard Turbo 20"/16"/13"	$1159
PaintBoard 8Li /20"/16"/13"	$339
PaintBoard Lightning	$829
24STV	$769
24Mx	$609
24XLTV	$2699
Movie Pak 2	$1539
Movie Pak 2 Pro Suite	$3479
RasterOps Sweet 16 Monitor	$949
RasterOps 20" MultiScan Color Display	$1619
RasterOps 20T Color Monitor	$2479
Sony 14"/17" MultiScan	$669 / $1139
Sony 17SE1	$1289
Sony GDM 2036s 20" MultiScan	$2169

THE LLB COMPANY, INC.

300 120th Avenue NE
Bldg 1, Suite 120
Bellevue, WA 98005
(206) 454-7256

"With customer Service Guaranteed. Depend on LLB for Quality, Service and Value"

- Airborne Express Overnight $6 and up
- First quality New, Brand Name products
- P.O.'s accepted upon approval
- All major credit cards accepted with no surcharge.
- Credit card not charged until order is shipped
- Orders received before 7:30 pm Eastern time weekdays shipped same day
- We export to most countries in the world
- All returns require approval and are subject to a restocking fee
- Prices subject to change
- Open 7 am to 6 pm M-F. 9 am to 4 pm Saturdays



Call 1 - 800 - 848 - 8967

PERIPHERAL 800 256-6581



Standard SIMMs

1 Megabyte	40.00
2 Megabyte	75.00
4 Megabyte	145.00
8 Megabyte	329.00
16 Megabyte	599.00

Video RAM

4 Bit to 8 Bit Upgrade (Mac II/IIx cards)	24.00
256K Quadra 700/900, Performa 46X VRAM	21.00
256K Quadras, LC 520 VRAM	25.00
256K Centris, LCIII, Performas VRAM	25.00
512K VRAM for LC, LCII, IIvx, IIvi, DuoDock, and Performas	39.00

68882 FPU Boards

25 MHz for Macintosh LC	55.00
20 MHz w/2 slots for Mac IIsi	119.00
25 MHz for Mac Classic II	55.00

Cache Cards, Etc.

128K Cache Card for LCIII and Performa 450	159.00
w/25 MHz FPU	239.00
IIsi 64K Cache Card	159.00
IIci 64K Cache Card	125.00
IIsi 2-slot Card and 68882	119.00

Math Coprocessors

68882 16 MHz FPU	39.00
68882 20 MHz FPU	45.00
68882 25 MHz FPU	49.00
68882 33 MHz FPU	59.00
68882 50 MHz FPU	99.00
68881 16 MHz FPU	45.00

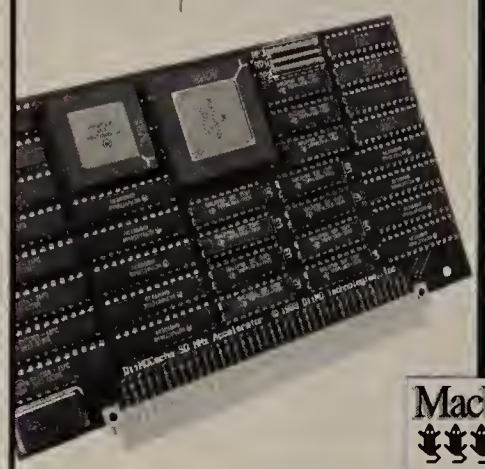
Miscellaneous

LaserWriter Pro 810 4 MB upgrade	275.00
LaserWriter Pro 810 8 MB upgrade	549.00
T.I. MicroLaser 1 MB	39.00
Mac Classic 1 MB Board	75.00
68851 16MHz PMMU	89.00

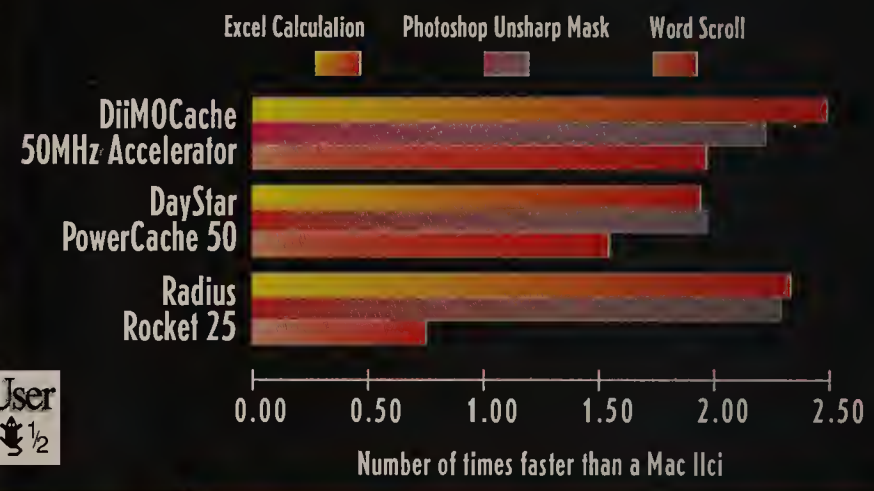
if requested, MODE 32 software included free w/PMMU

Mac Portable 3 MB Card	369.00
Mac Portable 4 MB Card	399.00
Mac Portable 5 MB Card	449.00

DiiMOCache 50MHz Accelerator $445



MacUser ★★★★½



72 Pin Memory *for the new Macs!*

	80ns	70ns	60ns
4 Megabyte	139.00	143.00	153.00
8 Megabyte	279.00	299.00	309.00
16 Megabyte	CALL	CALL	CALL
16 MB-Non Composite		625.00	645.00
32 MB-Non Composite		1249.00	1299.00

Newton PDA Upgrade Products

512K Static RAM Upgrade	125.00
1 Megabyte Static RAM Upgrade	169.00
2 Megabyte Static RAM Upgrade	289.00
2 Megabyte Flash Card Upgrade	259.00
4 Megabyte Flash Card Upgrade	425.00
8 Megabyte Flash Card Upgrade	749.00
16 Megabyte Flash Card Upgrade	1375.00



PowerBook Memory

	100	140/170	160/180	165c/180c	Duos
2 MB	95.00	95.00	---	---	---
4 MB	175.00	159.00	165.00	165.00	195.00
6 MB	259.00	225.00	239.00	239.00	225.00
8 MB	---	---	310.00	315.00	319.00
10 MB	---	---	385.00	405.00	---
14 MB	---	---	---	---	725.00
20/28	---	---	---	---	995.00/CALL

Speed up everything you do by up to 400% with this 50MHz 68030 accelerator by DiiMO Technologies. Awarded 4 1/2 Mice in MacUser's April 93 Accelerator Review, the DiiMOCache 50MHz 68030 Accelerator outperformed not only DayStar's PowerCache 50MHz but also most of the 68040 25MHz accelerators. And it costs less too! The DiiMOCache runs on the LC, LCII, LCIII, II, IIx, IIcx, IIci, IIvx, IIvi, IIsi, SE/30, the Performa 600 and 400 series. Call for adapter prices.

DiiMOCache 50MHz 68030 Accelerator

without FPU $445.00 with FPU $519.00

68040 PROCESSOR WITH FPU $299.00 AND UP - FOR THE CENTRIS/QUADRA 605,610,650,660AV, PERFORMA 475/476, AND LC 475.

TOLL FREE TECH SUPPORT

LIFETIME WARRANTY ON ALL MEMORY PRODUCTS

APPLELINK-PERIPHERAL

ORDER BY 6:30 PM CST FOR SAME DAY SHIPPING*

OVERNIGHT DELIVERY FROM $8.00 *some restrictions apply

Due to volatility in the market all prices and availability are subject to change without notice.

PERIPHERAL OUTLET, Inc.

327 East 14th, PO Box 2329 • Ada, Oklahoma 74820

International ☎ 405/332-6581 FAX ✆ 405/436-2245

CIRCLE 454 ON READER SERVICE CARD

Jungle Warfare Prices!

Power PC

Memory Blowout!

PowerPC—Memory Expansion Kits

8 meg kit	$309
16 meg kit	$634
32 meg kit	$1279
64 meg kit	$2559

PowerPC—Video Expansion Kits

1 meg kit	$89
2 meg kit	$189

30 PIN SIMMs

1x8 - 100	$38	4x8 - 70	$142
1x8 - 80	$42	8x8 - 80	$365
1x8 - 70	$45	16x8 - 70	$589
2x8 - 80	$73	16x8 - 70n/c	$609
4x8 - 80	$137		

72 PIN SIMMs 70ns/60

(4 mb) 1 x 32	$139/$149
(8 mb) 2 x 32	$285/298
(16 mb) 4 x 32	$585/639
(32 mb) 8 x 32	$1299/1389

POWERBOOK MEMORY

	140/170	160/180	165c/180c	Duos
4mb	162	169	165	165
6mb	249	254	258	—
8mb	—	329	339	298
10mb	—	429	435	—
18mb	—	—	—	969

HARD DRIVES

QUANTUM 2 yr. Warr.		INT/EXT
ELS 170mb	3.5"	$229/279
LPS 270mb	3.5"	$298/369
PRO 540mb	3.5"	$648/678
PRO 1050mb	3.5"	$979/1029
PRO 1225mb	3.5"	$1085/1129

QUANTUM GO DRIVES		
2.5 Powerbook Drives		INT/EXT
127mb	2.5"	$269/359
170mb	2.5"	$289/379
256mb	2.5"	$376/465

FUJITSU 5yr Warr.		INT/EXT
520mb	3.5"	$589/649
1.2mb	4.5"	$869/989
2.4mb	5.25"	$1489/1649

EXTERNAL DRIVE HOUSINGS

Complete w/ SCSI cable and power cable

Half Height	$85
Half Height Mini	$89
Full Height	$145

DAYSTAR DIGITAL Blow Out!

POWERCACHE

33MHZ POWERCACHE	$369
50MHZ POWERCACHE	$409
POWERCACHE ADAPTER•	$98

•Req'd for non Mac IIci, IIvi, IIvx, Performa 600

TURBO 040 ACCELERATORS

TURBO 040 (with FPU support)	
25MHZ TURBO 040	$699
33MHZ TURBO 040	$729
40MHZ TURBO 040	$1069
TURBO 040i (w/o FPU support)	
20MHZ TURBO 040i	$569
25MHZ TURBO 040i	$659
33MHZ TURBO 040i	$749
FASTCACHE TURBO (128 cache for turbo 040 family)	$169

APPLICATION ACCELERATORS

Image 040 (Quadra/Centris)	$1789
Quad 040 (Quadra/Centris)	$1299
Charger (Photoshop Accelerator)	$498
Charger Plus	$639
Charger PFS	$1819

SYQUEST Removable Technology

44mb Cart. $62 88mb cart. $94

Drives	INT/EXT
Memory Direct 44mb	$299/349
Memory Direct 88mb	$429/469
Memory Direct 88c	$469/499
Memory Direct 105mb	$429/469

MODEMS

Global Villoge Power Port
Bronze/Silver/Gold $169/$259/$285

Global Villoge Tele Port
Bronze/Silver/Gold $119/$269/$298

•New!
Global Villoge Mercury $339

Other Available Products

RASTEROPS, SUPERMAC, ASANTE,

Call on

IBM Memory,
PC Clone Memory,
Compaq and AST Products

SUPERMAC

Displays

Super Match 21 Two-Page	$2469
SuperMatch 20•TXL Multimade	$2615
SuperMatch 20 Calar Plus	$1709
SuperMatch 17 Multimade	$909
SuperMatch 17•T Trinitron	$1098
Platinum 21 Two-Page Display (9761)	$1098

Graphic Cards

Thunder II	$3329
Thunder II Light	CALL
Thunder/24	$1739
Thunder/24 PDQ Plus	CALL
Spectrum/24 Series IV	$847
Spectrum 8/Series IV	$409

Quicktime Movie Making

VideoSpigot NuBus* / LC	$379/259
Spigat & Sound NuBus*	CALL
VideaSpigat Pra NuBus* / IIsi**	CALL
Spigat & Saund Pra NuBus**	CALL

*FREE Adobe Premiere 2.0 LE
**FREE Adobe Premiere 2.0 Full Versian

RASTEROPS

Graphic Cards

RasterOps 24XLi	$1659
RasterOps 24MX	$639
RasterOps Paintboard Li	$349
RasterOps 8XLi	CALL
RasterOps 8XL	$479

Displays

20TMultiscan Color	$2499
20/20 Multimade Color	$1589
Sweet 16 Color	$999

ASANTE PRODUCTS

Mac SE (68000 PDS)

MC3SE Thick/Thin/10BaseT,32K	$209
MC+SEET Thick/10BaseT, 32K	$159

SCSI Products

EN/SC10T 10BaseT, Includes SCSI Cable	$249
EN/SCPB SCSI Cable w/HPDI-30 & DB-25 for PB	$55
FriendlyNet Adapters (All models)	$89

10Base T Hubs

10THUB/12 10Bs T Hub w/12 10T, Thk/Thin Port	$489
AH1701 12-pt Smt Hub w/SMNP H/W Module	$909

EtherTalk to LocalTalk

AP1002 AsantePrint, Thik/Thin	$329
AP 101 Asante Print, Thick/10BaseT	$329

Mac II Family & Performa 600 (nuBus)

MC3NB Thick/Thin/10BaseT, 64K	$209
MC+IIE64 Thick/Thin, 64K	$159

Mac IIsi & SE/30 (68030 PDS)

MC 311SI Thick/Thin/10BaseT, 64K, FPU Socket	$209
MC+30IE64 Thick/Thin/64K, FPU Socket	$159

LC/LCII/Performa 400 (68020, 68030 PDS)

MC+LCII Thin/10Base T, FPU Socket	$209

5 Year Warranty

7921 Professional Circle
Huntington Beach, CA 92648

Same Day Shipping – P.O.'s, Educational & Corporate P.O.'s, Government
We accept: AMEX, VISA, MASTERCARD & DISCOVER

Lifetime Warranty. Prices subject to change without prior notice.
International and local

800-989-6348 **714-848-5958**

MEMORY DIRECT!

Terms & Conditions: RMA numbers are required for all returns. All unopened, refused, canceled or non-defective returns will be subject to a 15% restocking charge.

CIRCLE 516 ON READER SERVICE CARD

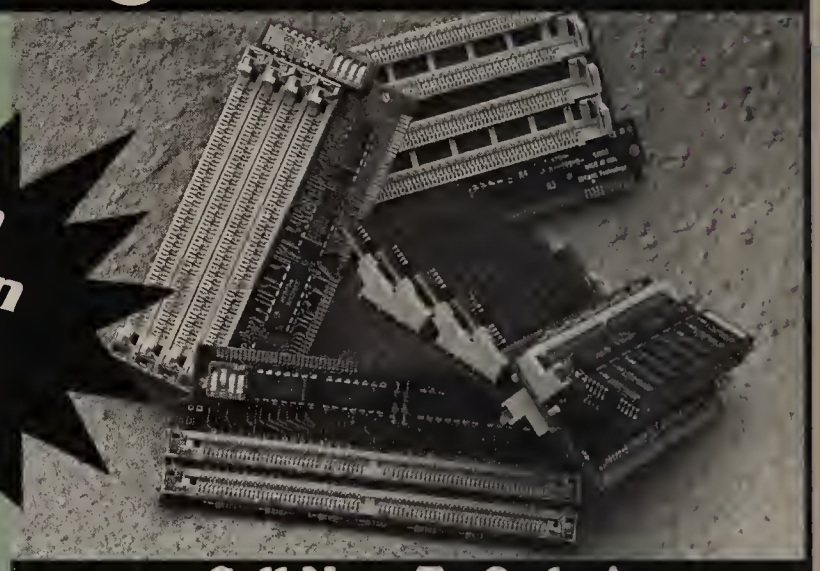
Macworld SHOPPER®

Memory is a Terrible Thing to Waste!!!

With **SimmStack™** you can:

- Use your 30-pin SIMMs in your 72-pin Mac
- Convert one 72-pin SIMM slot into two slots

30 pin to 72 pin SIMM Converter



SAVE Money on Memory!!!

Easy To Install
Simply plug old SIMMs into **SimmStack™** and plug into 72- pin slot of your Mac. 100% Compatible.

SAVINGS
Beat the high cost of memory by utilizing existing memory in your new system. Enables you to recycle your old memory.

Call Now To Order!
(800) 209-7126

SimmStack™ is available for most 72-pin Macs including PowerPC Macs

Also Available:
72 pin SIMM
Slot Doublers

SERMAX CORPORATION
New York, NY
Tel: (212) 410-1597
Fax (212) 410-0452

MasterCard VISA

Guarantee: We Stand Behind Our Products! All products carry a 30 day money back guarantee.

CIRCLE 598 ON READER SERVICE CARD

M E M O R Y

CALL US LAST FOR LOWEST PRICES ON ALL MAC MEMORY,
1MB - 32 MB. FOR ALL POWER BOOKS, DUOS & PRINTERS,
FPU CARDS, FPU CHIPS, PMMU CHIPS & VRAM

LIFE TIME WARRANTY

M.C., VISA & DISCOVER
P.O.'S WELCOMED

1-800-662-SIMM (7466)

SERVING THE INDUSTRY SINCE 1963

DATA MEMORY SYSTEMS
508-683-2325 FAX 508-975-5232
15 UNION ST. • LAWRENCE, MA • 01840

CIRCLE 447 ON READER SERVICE CARD

SOURCE INTERNATIONAL

Silicon Valley's
FIRST CHOICE
for
Computer Memory

(415) 323-6059
Fax (415) 326-3552

CIRCLE 592 ON READER SERVICE CARD

Pack your Powerbook in seconds!



1236 N.W. Flanders, Portland, OR 97209
(503) 248-0053 FAX (503) 274-7685
CALL TOLL FREE! 1-800-548-0053
(9-5 Pacific Time)

CIRCLE 444 ON READER SERVICE CARD

Dynamic Engineering

PowerBook & Duo **Accelerators**
MacPortable Memory, HDD, Batteries
Mac & PC Systems & Accessories
PowerBook 100 Batteries $69
PLI 88/105 Syquest **HP** Printers & FAX
From PAL to **PowerPC** Simms...We have Memory
435 Park Dr., Ben Lomond, Ca. 95005 (P)408-336-8891 (F)408-336-3840
VISA MC P.O.
(408) 336-8891

CIRCLE 555 ON READER SERVICE CARD

Attn: IIfx and IIci Owners
Accelerate your Mac IIfx and IIci with Fusion Data's TOKAMAC accelerators. • 20-50% faster than a Quadra 950. • Buy at super low factory direct prices • 30 day MBG • Lifetime warranty • Toll Free tech support • 1992 MacUser Editor's Choice "Best accelerator of the year!"
Fusion Data Systems TokaMac
8920 Business Park Drive
Austin, TX 78759
(800) 285-8313
(512) 338-5326
(512) 338-1276 FAX

HOT SHOPPER PRODUCT CATEGORIES
HELP BUYERS



FIND THE PRODUCTS
THEY NEED FAST.

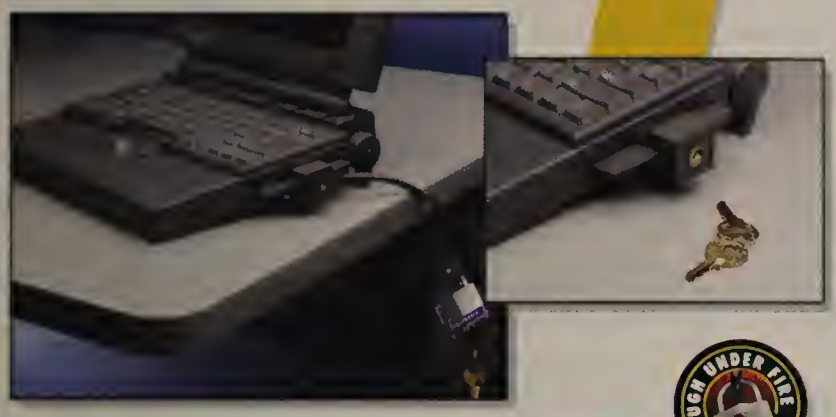
Sentinel PowerBook™ Security

NEW! From Secure-It

Stop PowerBook™ theft with the Kāblit™ Sentinel

Dual Security Features:

- Prevents theft by securing your PowerBook computer to desks, tables, chairs, etc.
- Secures your disk drive, preventing tampering and unauthorized data access
- Simple system for quick and easy installation.
- Portable; goes with you wherever you take your PowerBook



Secure peace-of-mind at the office, at home, the airport, and anywhere else you and your PowerBook travel.

TOUGH UNDER FIRE

Padlock Security Provided by Master Lock

For more information call 800-451-7592... Secure-It 18 Maple Court, East Longmeadow, MA 01028

The particular Master Lock Trademarks used are trademarks of the Master Lock Company and are used by Secure-It, Inc. under license.

CIRCLE 574 ON READER SERVICE CARD



Batteries • • • Chargers • • • Accessaries

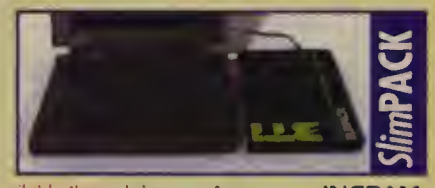
for Macintosh PowerBooks™ & Duo™

PowerBook Products:

SlimPack for Powerbook(MC-180S)	$169.95
PowerGage Battery (MC-180)	$ 89.95
High Capacity Battery (MC-170)	$ 69.95
PowerCharger Plus (MC-SC100)	$149.95
PowerCharger(MC-CHR)	$129.95
Automobile Power Adapter (MC-AP100)	$ 99.95
Swapper for PowerBook (MC-SWP1)	$ 14.99
Starter-Kit (MC-170+MC-CHR)	$149.95
Power-Kit (MC-180+MC-SC100)	$199.95

Other Products:

SlimPack for Duo (MC-200S)	$299.95
RapidCharger for Duo (MC-SC200)	$149.95
Automobile Power Adapter for Duo (MC-AP200)	$ 69.95
X-Pack Extended Battery and case for Newton MessagePad (NT-K01)	$119.95



3Ti Battery Technology, Inc.

* Dealers: Products available through Ingram * INGRAM MICRO

5700 Bandini Boulevard, Commerce, California 90040

Tel: (213) 728-7874 • (800) 982-8284 • Fax: (213) 728-7996

CIRCLE 509 ON READER SERVICE CARD

PROTECT YOUR MAC

Finest Quality, Custom-Fit!

ALL FABRIC

- Heat Ventilating, will not shrink or deteriorate with age! • Machine Wash & Dry! • All makes & models! • Custom orders! • Tan, Navy, Royal Red, Maroon, Gray, Brown or Black • 100% Satisfaction Guaranteed! • Outstanding service since 1983! • Found a lower price? Call us!!

8 Color Choices!

Choose Monogramming or Heat Transfer of your Favorite Photo

11-30 Classic/II & Kybd (2pc)	$24.95	11-99 Adj Kybd & Kypd (2pc)	$11.95
11-94 Color Classic & Kybd	24.95	10-86 Mac Extended Kybd	9.95
11-84 LC, Mac14" & Kybd(2pc)	29.95	11-80 Mac 14" Color Display	19.95
11-95 Centris610,14"&Kyb(2pc)	29.95	11-74 Mac 16" Color Display	24.95
11-96 Centris 610 CPU Only	15.95	10-37 Imagewriter II	15.95
11-77 Centris650,14"&Kyb(2pc)	29.95	11-93 LaserWriter Pro 600	19.95
11-79 IIvx/Centris 650 CPU	15.95	11-98 LaserWriter Select 300	24.95
11-97 Quadra 800 CPU	15.95	10-90 LaserWriter II	24.95
11-59 Quadra 900/950 CPU	19.95	11-25 Personal LaserWriter	24.95
12-05 Quadra 840AV CPU	15.95	11-52 StyleWriter	15.95
12-06 DuoDock,14"&Kyb(2pc)	29.95	11-91 StyleWriter II	15.95
NEW! PowerBook Pouch	19.95	91-22 H-P DeskWriter/550	19.95
???? Don't see listed here??	CALL	SKIN Apple Keyboard Skins	15.95

Add $4.00 Shipping & Handling (Check, MO, COD, VISA/MC) Specify Kybd

CO-DU-CO Computer Dust Covers

4802 W. Wisconsin Ave., Dept. MW, Milwaukee, WI 53208

800-735-1584 414-476-1584 • 476-9329 FAX

CIRCLE 455 ON READER SERVICE CARD

DUPLICATION FROM $.80

HIGHEST QUALITY MEDIA

- All Diskette Formats • Full Verification
- Diskette Mailers/Accessories
- Custom Labels • Assembly Services
- Generous Volume Discounts

FORMATTED DISKETTES

FORMATTED	QTY 250	BLANK
$.69	3.50" DS/HD	$.59
$.56	3.50" DS/DD	$.49

- FREE FORMATTING on First Order
- BASF, MEMOREX, VERBATIM
- SONY AVAILABLE for Small Upchrg.
- COLORED MEDIA Please Add $.05

800-255-3142

Diversified Systems Group, Inc.

P.O. Box 1114, Issaquah, WA 98027

CIRCLE 496 ON READER SERVICE CARD

SUPER MAT™ ...the new comfort edge

The Best Way To Reduce Annoying Noises Fits Neatly Under Your Computer

Unwanted noises are absorbed and damaging vibrations are dampened by Super Mat's new high-tech material to create a less stressful working environment. Plus Super Mat:

- Protects CD-ROM & Hard Disks
- Protects your desk from marks and scratches
- Works great under printers

Save $5.00 Reg. $24.95. Now only $19.95

Add $4.75 Shipping/Handling, Cal. res. add 8.25% tax

60 day money-back guarantee

Call or send check or M/O to "INOVA Tec"

1933 Davis St., Ste. 289, San Leandro, CA 94577

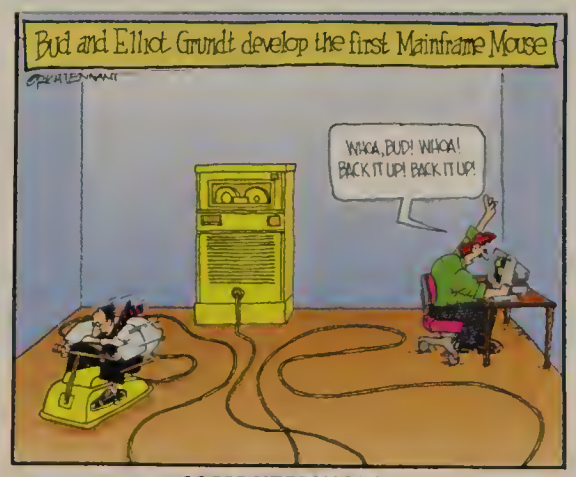


CALL 1-800-88-INOVA 24 hr

Accept VISA

CIRCLE 581 ON READER SERVICE CARD

COMPUTERWORLD's "5th Wave" Cartoon Mouse Pad



COMPUTERWORLD

COMPUTERWORLD brings humor to a mouse pad featuring a cartoon from "The 5th Wave" series by Rich Tennant. Not available in stores, this colorful foam-backed pad will keep your mouse clean and protect your desktop. Best of all, it's only $4.99*. Send your name, address and check or money order to **COMPUTERWORLD**, P.O.Box 9171, Framingham, MA 01701, Attn: Product Fulfillment. For credit card orders, call 1-800-343-6474.

*In U.S., for each unit ordered, add $1.25 for postage and handling; orders outside U.S. add $2.50 each. Residents of MA, CA, GA, NJ, and DC add applicable sales tax. Canada residents add G.S.T. CSMW3

Explore the Internet - FREE!



DELPHI, a leading international online service, now offers full access to the Internet. You can explore this incredible electronic network with no risk. You get 5 hours of evening/weekend access to try it out for free!

Use electronic mail to exchange messages with over 20 million people throughout the world. Download programs and files using "**FTP**," connect in real-time to other networks using "**Telnet**," and participate in "**Usenet Newsgroups**" the world's largest bulletin board with over 4500 topics. If you're not familiar with these terms, don't worry; DELPHI has expert online assistants and a large collection of help files, books, and other resources to help you get started.

After the free trial you can choose from two low-cost membership plans. With rates as low as $1 per hour, no other online service offers so much for so little.

5-Hour Free Trial!

Dial by modem, 1-800-365-4636*
Press Return once or twice
At Username, enter JOINDELPHI
At Password, enter MCW46

DELPHI

*Current Internet users can Telnet to delphi.com instead
Complete details provided during the toll-free registration

Questions? Call 1-800-695-4005 (voice)
Send e-mail to INFO@delphi.com

CIRCLE 583 ON READER SERVICE CARD

MUSIC FOR EVERYONE!

Both programs compatible with MIDI but MIDI is not required.



SONGWORKS
NEW! Your songwriting partner automatically notates your melody, suggests chords, suggests endless tune ideas, aligns lyrics, plays, transposes, prints. $125.00

PRACTICA MUSICA
Your personal music tutor. Provides ear training and music theory from beginning to advanced. Includes textbook. $125.00

ARS NOVA • 1-800-445-4866, FAX 1-206-889-0359 • Box 637, KIRKLAND, WA 98083

CIRCLE 595 ON READER SERVICE CARD

Software Up To 80% Off
(Student-Teacher-School)

PageMaker 5.0	$299	Photoshop 2.5.1	$269
Illustrator 5.0.1	199	WordPerfect 3.0	129
Premiere 3.0	249	FrameMaker 4.0	249
CodaFinale3.0.1	250	Mathematica 2.2	199
F.D.Painter 2.0	199	F.D.Sketcher	69
ClarisWorks 2.0	149	Lotus 1-2-3 1.1	129
Auth.ware2.0.1	995	AutoCAD R12	937
Macromind 3D	748	Director 3.1.3	598
MS Word 5.1	129	MS Excel 4.0	169
Foxbase+ 2.01	189	MS Works 3.0	129
MacTools 3.0	89	Adobe Dimensions	99
AdobeSuperATM	79	Freehand 4.0	249

Much more...School P.O ore Welcome!

Orders-(800) 377-9943
Info/Cat.(201) 585-0662 Fax (201) 585-0226
Software Plus
440 West St.,Fort Lee, NJ 07024

CIRCLE 538 ON READER SERVICE CARD

BIBLE MASTER™
NAS COMPUTER BIBLE

Get them all together...

King James Version
New International Version
New American Standard Bible

...the best selling translations!

...add on module
NAS Hebrew/Greek Dictionaries

...Just the fastest, finest, easiest to use, most powerful Bible software around...

American Bible Sales
870 S. Anaheim Blvd.
Anaheim, CA 92805
1-800-535-5131

DISCOUNT SOFTWARE PRICES

CIRCLE 537 ON READER SERVICE CARD

Music For The Mac
The full scale of Products

❑ From instructional music software, like our own Compose Yourself; to the intricacies of Hard Disk recording.

❑ Authorized dealer for Coda, Digidesign, E-MU, Mark of the Unicorn, Opcode, Panasonic, Ramsa, Roland, Steinberg-Jones *and more.*

Expert advice before you buy, and full tech support after you purchase!

MacBEAT™
1314 Rufina Circle A4
Santa Fe NM 87501

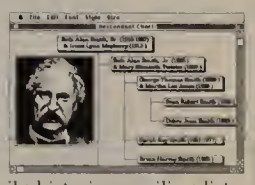
Call the Experts at:
1-800-MAC-BEAT or
505-473-4929 fax: 505-473-4647
Free Catalog Available!

CIRCLE 572 ON READER SERVICE CARD

Family Heritage File™
Genealogy. New Version 3.3! Most powerful and easy genealogy program on Mac. Rated "BEST" by Macworld. Designed by genealogy professionals. • Stand alone • Graphic Pedigree, Descendants, Family Group, Individual, Marriage, Surname • Unlimited History • Sorted Lists • Export to WP/data base/ modem • GEDCOM compatible • Jewish/LDS features. $149 + 5 s/h. Ask about Family Heritage Bundle. Visa/MC. Demo $7. Free Lit Pak.
Star•Com Microsystems
Windsor Park East
25 West 1480 N., Orem, UT 84057
801/225-1480

REUNION®
the family tree software

4½ *MacUser* Oct '90



Reunion organizes your family information, displays pictures, shows relationships, creates large graphic tree charts, family group records, family histories, mailing lists, questionnaires, and more. To order, call 1-800-334-4444. For a free brochure, contact:

Leister Productions
P.O. Box 289, Mechanicsburg, PA 17055
Phone 717-697-1378 — *Fax* 717-697-4373
CompuServe 71201,1105 — *AOL* LeisterPro

Now available for Mac and Windows.

Family Roots™
Genealogy. Do it YOUR way! Huge variety and capacity for your family history. Make pedigree charts, descendants charts, person sheets, group sheets, indexes and much more. Customize to your own preferences. Standard Mac interface. Call for FREE information. Satisfaction guaranteed. MC/Visa/AE.
Quinsept
Box 216
Lexington MA 02173
617/641-2930
800/637-ROOT

Macworld SHOPPER®

EDUCATIONAL & RECREATIONAL

NETWORKING & COMMUNICATIONS

STUDENTS TEACHERS

Story Artist's Kit makes writing fun! Includes over 90 scenes & characters, color paint program, plus 3 exciting fonts:

Aladdin
DRACULA



Try free demos of lesson planning, grading & testing software. Type fractions & roots with MathMaker Fonts, and see our new School Fonts.

800•669•6574
415•752•6506 fax



MOUNTAIN LAKE SOFTWARE, INC.

CIRCLE 478 ON READER SERVICE CARD

GRADE MACHINE

MACWORLD ★★★★
See *Macworld* review 12/92 (p.263)

GRADING MADE EASY!

Use Grade Machine. It's fast, flexible and easy to learn with weighted assignment categories, custom reports, narrative comments, student graphs and much more. Not copy protected. System 7 and networkable. ***Affordable*** site licenses and multi-teacher packs available.

Rated #1 Productivity Program by teachers
—Electronic Learning Suppl., 4/93, p.7

Still only **$79** *+$5 S&H*
***($99 Deluxe Edition** adds seating charts, attendance & more!)*

Misty City Software
11866 Slater Ave NE
Kirkland, WA 98034

Call (800) 795-0049 *to order yours today!*
or, fax your order to us at (206) 820-4298

30 DAY MONEY-BACK GUARANTEE!

CIRCLE 513 ON READER SERVICE CARD

MAC Grade



$85.00
Plus $4.50 Shipping
(CA add $5.17 tax)
MC/VISA

Take the work out of GRADING!

Save time and energy with MacGrade, the powerful grade manager that's fast, fun and exceptionally easy to use. Great reports and graphs.
New! Version 2.2 has separate elementary and secondary/college editions.

Call (800) 795-0641

CalEd Software
P.O. Box 22913, Carmel, CA 93922
60 Day Unconditional Money Back Guarantee.

CIRCLE 406 ON READER SERVICE CARD

Bible Book Store On Disk

Full Featured, Fast and Friendly Bible Study software. As the leader in Bible Study software since 1981 we have continued to listen to our customers and provide them with the tools they need. We offer the most comprehensive line of Bible study tools available.
Call for FREE catalog.
Bible Research Systems
2013 Wells Branch Pkwy #304
Austin, TX 78728
800/423-1228
512/251-7541

LXR·TEST BEST IN TESTING

Highest-rated software for every testing environment: classroom, school, district, governmental, industrial and certification.

- ✓Item Banking & Test Production
- ✓Test Scoring w/Group Comparison
- ✓Mastery Reporting & Remediation
- ✓Survey Scoring and Analysis
- ✓Interactive Testing with Movies
- ✓Weighted & Multi-Response Grading
- ✓Accomodates All Question Types
- ✓Integrated Design (Mac & Windows)

Logic eXtension Resources
909•980•0046 Fax: 987•8706
7168 Archibald Ave. Suite 240
Rancho Cucamonga, CA 91701

CIRCLE 407 ON READER SERVICE CARD

COMPUTER GRAPHICS

- Animation
- Desktop Publishing
- Photo Retouching
- Computer Illustration

1-800-225-9023

INTERNATIONAL FINE ARTS COLLEGE
1737 N. Bayshore Dr., Miami, Florida 33132
or Fax your inquiry to: (305) 374-5933
Classes start Jan. & Sept.

Name _____
Address _____
City _____ State _____ Zip _____
Phone (___) _____
Yr of HS Graduation _____ Age _____

CIRCLE 565 ON READER SERVICE CARD

STUDENT - TEACHER DISCOUNTS!!

****FULL PACKAGES & LATEST VERSIONS****

QUARKXPRESS 3.3 $299
PAGEMAKER 5.0 $249

AUTOCAD 12 W/AME	$299	MINICAD +4	$295
CANVAS 3.5	$175	MS EXCEL	$179
CLARIS WORKS 2.1	$149	MS OFFICE	$269
CODA FINALE 3.01	$249	MS WORD	$125
FRACTAL PAINTER 2.0	$179	RAY DREAM DESIGNER 3.0	$185
FRAMEMAKER 4.0	$239	STRATAVISION 3-D 3.03	$299
FREEHAND 4.0	$195	WORD PERFECT 3.0	$135

CALL FOR FREE CATALOG!! (800) 289-3275
Products Also Available By Adobe, Lotus & Symantec

THE SOFTWARE SOURCE CO, INC.
2517 HWY 35, BLDG N, SUITE 201, MANASQUAN NJ 08736
PHONE (908) 528-0030 FAX (908) 528-9378

CIRCLE 570 ON READER SERVICE CARD

OVER 1/2 MILLION ACTIVE BUYERS FIND WHAT THEY ARE LOOKING FOR *IN THE* MACWORLD SHOPPER SECTION.

Claire

The Personal Music Coach



Music Education Software that Listens to You!

"Claire could forever change the way musicianship is taught."

MACWORLD MW ★★★★

$129.95 Order Direct
1-800-557-2633 Ext531

OPCODE
3950 Fabian Way Suite 100
Palo Alto, CA 94303

CIRCLE 501 ON READER SERVICE CARD

Graphic Astrology

Professional quality software for all your astrological needs. Charting programs, Interpreters, atlases, fonts! State-of-the-art features, high-resolution output, superior accuracy.

FOR ASTROLOGERS AND STUDENTS OF ASTROLOGY

Call or write for FREE catalog!

Time Cycles Research
27 Dimmock Rd Waterford CT 06385
(203) 444-6641 • Fax (203) 442-0625

TeleFinder™ Bulletin Board System

GROUP EDITION BBS

The leading Macintosh BBS for business and education. First in quality and performance.

- "The best BBS available on any platform, at any price." - *MacUser (UK).*
- "Best Communications Software 1992" - *MacWorld Australia.*
- Multi-user chat, E-mail, ZMODEM file transfer, conferences, find file, and graphic user interface.
- Supports Mac and PC users.
- TeleFinder is $425 for unlimited users, includes host and user communication software.

Call for free eval disk!

Spider Island Software
4790 Irvine Blvd #105-347 Irvine, CA 92720
tel (714)669-9260 fax (714)669-1383
bbs (714)730-5785

CIRCLE 597 ON READER SERVICE CARD

CD-ROM COLLECTION SPECIALS!

Call for Catalog

Buy any 3 for $99
Buy any 5 for $129

Buy any 7 for $169
Buy any 10 for $229

ALL Titles in Stock

New Grolier's MM Encyclopedia
~~$395~~ retail $99 CD Link special
Includes 33,000 articles, maps, audio, video and animation from topics such as The Gulf War, Rise and Fall of the Roman Empire, World Communism, and much more.

World Atlas
~~$79~~ retail $49 CD Link special
More maps. More facts. And more easy to use features than any other atlas.

Desert Storm
~~$59~~ retail $39 CD Link special
Week by week look at the Gulf crisis as covered by Time including unique information previously unavailable to the public.

Supertoons
~~$59~~ retail $29 CD Link special
Contains 30 minutes of full color QuickTime movies featuring Superman. Complete with audio.

Space Shuttle
$79 retail $29 CD Link special
Visit the Johnson Space Center. Blast off, launch a satellite, walk in space from your own cockpit!

The Animals (San Diego Zoo)
$59 retail $39 CD Link special
Over 200 exotic mammals, birds and reptiles using movies, sounds and stories from one of the world's greatest zoos.

Word Tales
$59 retail $39 CD Link special
Help your children learn to spell. Discover a jungle and play games of words, letters and suprises.

Quicktoons II
$49 retail $29 CD Link special
An nastalgic QuickTime movie compilation of some of the best and timeless cartoon classics.

Oceans Below
$49 retail $29 CD Link special
Explore some of the world's most exotic underwater destinations. Contains over 200 video clips and 125 photographs.

US Atlas
$59 retail $39 CD Link special
All new and better than ever. Everything you ever wanted to know about the US.

Capitol Hill
$49 retail $29 CD Link special
It's Congress like you've never seen or heard before. A close-up of Congressional debates, powerful people and more.

Great Business Jokes
$79 retail $29 CD Link special
More than 175 business jokes delivered by pro comics. A must for business presentations.

The View from Earth
$79 retail $49 CD Link special
Thousand of colorful images and hours of audio and video narration. Based on "Voyage Through the Universe" series

The Orchestra
$79 retail $49 CD Link special
See the instruments in an orchestra. Hear how they sound and learn how they are played. More than 500 CD Audio examples.

Funny
$59 retail $19 CD Link special
Based on Bran Ferren's award-winning motion picture. From Time-Warner Interactive group

Mac Procuct Directory
$149 retail $49 CD Link special

AMERICAN EXPRESS Card · VISA · MasterCard

Call for ADULT XXX Catalog

CD LINK FAX 818-785-3100 800-858-0311

CIRCLE 535 ON READER SERVICE CARD

Power Tools for the Power Presenter

Project full color images directly from your computer and eliminate the expense and hassle of slides and transparencies. Make more effective and powerful presentations. Call us now for the best in portable LCD panels and all-in-one projectors!

SALES•LEASES•RENTALS

- All major brands-- one stop shopping
- Compatible with Mac/PC/Powerbook, QuickTime
- Knowledgeable staff
- Visa, MC, AMEX, Purchase Orders, GSA pricing
- Overnight shipping available
- Satisfaction guaranteed or your money back



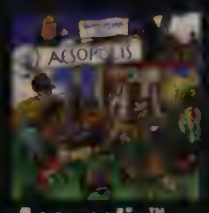
Call Today 1 800 726 3599
FREE CATALOG

Panelight
DISPLAY SYSTEMS, INC.

101 The Embarcadero Ste. 100-A, San Francisco, CA 94105 Hours: 6:30 to 5:30 PST, 9:30 to 8:30 EST VOICE: 415 772 5800 FAX: 415 986 3817

CIRCLE 578 ON READER SERVICE CARD

Quantum Leap CD Software



Aesopolis™
Kids of all ages love Uncle Bits, your guide through Aesopolis, the Interactive World of Aesop's Fables. You'll love his crazy antics and colorful costumes. ★★★★½ *MacUser*



Game Collection™ NEW!
An outstanding collection of more than 160 top-rated Macintosh games, puzzles and adventure programs. The Super-CD-ROM for game players of all ages.



Coral Collection™
Fisheye View's Coral Collection™ offers a look at the mysterious world of living coral animals. From the Caribbean Islands to the Coral Sea and Pacific Ocean.



Fish Collection™
Fisheye View's Fish Collection™ is a new-generation Portfolio Photo CD featuring 104 spectacular images of Caribbean Fish, Sharks, Rays, Eels; with narration.



CD7™
The System 7 Super-CD contains thousands of enhancements and utilities to super-charge your Macintosh system.



Macademic™
All educational software for teachers & students: includes art & music, math & sciences, plus foreign languages.



Mega-ROM™
A Super-Value CD. QuickTime™ movies, sounds, fonts, games, utilities, Hyper-Card stacks and more…



Giga-ROM™
Giga-ROM is the largest collection of Macintosh shareware you can buy. All files are compressed.

Call 800-762-2877 for a free catalog.

Quantum Leap TECHNOLOGIES
Quantum Leap Technologies, Inc.
2916–B Ponce de Leon Boulevard
Coral Gables, FL 33134 USA
Phone: 305-446-4141 • Fax: 305-446-4074

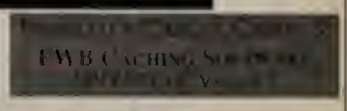
CIRCLE 571 ON READER SERVICE CARD



CIRCLE 594 ON READER SERVICE CARD

MAC MULTIMEDIA

Loviél 2X CD ROM Drive $349
Loviél 3X CD ROM Drive $549



UPGRADE YOUR BUNDLE w/ SPEAKERS & 4 TITLE CHOICES FROM OUR EXTENSIVE CD LIBRARY FOR JUST $100. INCLUDING COMPTONS ENC., JUMP RAVEN, MAYO CLINIC, THE BEATLES, NAUTILUS, JAZZ, TOONS, DINOSAURS…

COMPLETE MULTIMEDIA SYSTEMS

° We Stock Desktop Video and Authoring Systems— Plug & Play right out of the box!
° High End Video, 3D, & Graphic Software—Strata Pro, CoSA, Director, Premiere…

LOVIÉL
Storage — 1.2 gig —$799
RAM — 4 meg SIMM — $150
Lowest Prices — CALL
West 800-688-3696
East 800-688-3697
Fax 612-828-6881
Dealer calls welcome

CIRCLE 534 ON READER SERVICE CARD

QuickTime Transfers
Home VHS, VHS-C, 8MM, Hi-8 or 3/4" video to Quicktime movies. Transfer Quicktime and Multi-Media Presentations (MM Director, etc.) to FULL SCREEN video onto above video formats. DIGIVision reads and records to CD-ROM, SyQuest 44/88MB or Floppies, at 15fps to 30fps, 160x120 to full screen, mono and stereo audio. $10/1min., $28/5 min., $45/10min., $80/20 min.
DIGIVISION
800-880-6444
310-475-9226 Fax



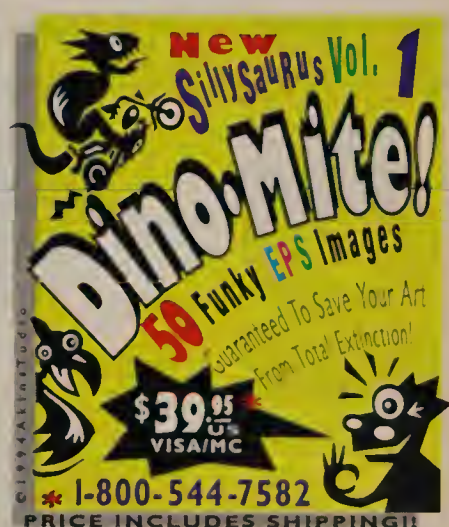
DesignWorkshop™

A Design Breakthrough
…intuitive 3D modeling
PowerPC Native or 68-K

- easy, fast, intuitive 3D CAD
- 3D direct manipulation
- sketch in live 3D perspective
- object-based shadows
- fit, flip, snap to objects
- paste into openings
- sun studies, walkthroughs
- import/export DXF, PICT, etc.

Call Artifice: 503-345-7421
or fax: 503-346-3626
In Canada: 204-453-8111

CIRCLE 408 ON READER SERVICE CARD



CIRCLE 568 ON READER SERVICE CARD

Logo Design Software

Create logos like this in minutes; sell them for $75 - $500.

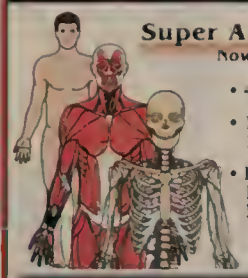
Logo SuperPower® is a large graphic database. You use one or more "design elements" and modify them to create world-class logos in minutes. There are **over 2,000 logo design elements** in the full package. Or, choose the basic package of 660+ elements. For the Mac: Requires FreeHand or Illustrator.

Logo SuperPower - basic
(660+ design elements) $119
Logo SuperPower - full
(all 2,000+ design elements) $279
To order, or for information, call
(800) 648-5646
Decathlon Corp. • 4100 Executive Park Dr.
Cincinnati, OH 45241
Phone (513) 421-1938

CIRCLE 533 ON READER SERVICE CARD

Super Anatomy Collections
"…technically and artistically superior.""

LifeART™
Professional Medical Clip Art
CD-ROM



Super Anatomy 1,2,3
Now Shipping!

- 400 New Images
- 100% Compatible In all Mac Software
- Editable in Illustrator and MacDraw Pro!

TechPool Studios
Cleveland, Ohio
Tel 216-291-1922
Fax 216-382-1915

FREE Catalog
800-LifeART
543-3278

☆☆☆☆☆ *Medical Software Reviews

CIRCLE 415 ON READER SERVICE CARD

MAPArt **MAPS FOR GRAPHIC DESIGN**

"Best Collection Map Category"
Clip Art's Greatest Hits
MacWorld, January 1994

"Fine Artwork"
MacWorld 1992



World Maps
Continents
Major Countries with States & Provinces
US States with Interstates, State Highways, 3 Digit Zip Areas & Counties!

FULLY EDITABLE WITH ILLUSTRATOR, FREEHAND & OTHER PROGRAMS!

CARTESIA 5 S. Main St., Box 757 Lambertville, NJ 08530
Voice 609-397-1611
24 hr. FAX 609-397-5724

CALL FOR FREE CATALOG
800 334-4291

CIRCLE 417 ON READER SERVICE CARD

Sometimes Its Best To Sweat The Details And With A Graphic Translator Like CADMOVER... Its All Details!!



We couldn't call a release this big a 3.5. Kandu went into hyperdrive and didn't stop until CADMOVER 4.0 was ready to ship. We missed both our deadline and our release number, but took the time to create something really worthwhile for our customers.

The new CADMOVER is faster, plus:

- All New Editing Dialogs
- Task Specific Output Controls
- A Scripted Batch Processor
- Ångstroms to Astronomical Units Translation Accuracy
- New EPSF Readers For AutoCad v. 12, Gplot, & Pro Engineer (Vector)
- Five NewIntegrated Formats, ClarisCad, Wavefront (.OBJ) Presenter Professional, Envisage 3D, and MiniCad+ 4.0 Text.
- See You At MacWorld Washington – Booth 910

KANDU
Software Corporation
703-532-0213

CIRCLE 477 ON READER SERVICE CARD

ADOBE™

New, Lower Prices	Adobe List	FF Price
	$275	$187.50
All Fonts Ship Same Day	$205	$142.50
	$145	$96.50
$3 Overnight Delivery	$105	$72.50
	$80	$52.50

Call for Free Catalog
Fonts in a Flash™
(800) 435-1303
9:30-4:00 Central, M-F
AMERICAN EXPRESS VISA MasterCard
No Surcharge

Medical Office Mgmt
TessSystem 3™ is a complete system for insurance processing, patient billing, accts receivable, patient transactions, report generation & much more. Single/multi doctor, single/multiuser. Flexible & very easy to learn. Optional electronic claims. From $2,995. New practice discounts available. Call Today!
Tess Data Systems, Inc.
14340 Torrey Chase Blvd, Ste 340
Houston, TX 77014-1021
800/218-TESS - Sales
713/440-9995, 713/440-6526 Fax

R.E. Agent & Property Mgrs.
Contact Pro™—Puts you in control of your day. Be more productive at prospecting, follow-up, listing & selling. Includes present/future home profiles, property statistics, phone dialer, full word processor, to do list, marketing/mailing plans & much more.

Tenant Pro™—Manages properties. Full GL, AR, AP, check writing, budgeting. Instantly tracks vital information on tenants, owners, units, vendors & properties. MICR, custom reports & multi-user version available. Call for FREE DEMO DISK!
Actoris Software Corporation
800-964-2792

Care4th® PRO
An ELECTRONIC MEDICAL RECORD SYSTEM and DATABASE with full printout support. Imagine your entire medical record shelf & much more in a lap or desktop Mac! Utilize clinical data in ways you could never have imagined. In 40 states and abroad, Care4th® Pro is the gold standard. Single & network versions available, starting well under $3000!
Med4th Systems, Ltd.
716 East Carlisle Avenue
Milwaukee, WI 53217
414/963-1985 Voice and Fax



Detailed Networks in Minutes with NetDraw® 2.0!

With over 330 professionally drawn images, NetDraw® 2.0 gives users immediate access to clip art symbols for LANs, WANs, computing, PCs, telephony and patching and cabling. Also included are flow charting symbols as well as mapping graphics to depict your networks geographically. Available now for just $129.95, NetDraw® 2.0's complete clip art library is easily imported into most Macintosh applications. **Call 800-643-4668 to order your copy today!**

NetDraw® Clip Art for Building Networks®

CIRCLE 461 ON READER SERVICE CARD

ALSO AVAILABLE ON CD-ROM
AdArt©
Encapsulated Postscript Images
FEDERAL EXPRESS
REALTOR®
RECYCLED ART
REAL ESTATE ART
FLAGS OF THE WORLD
CARS & LIGHT TRUCKS
LOGOS & TRADEMARKS, 1 - 11
INT'L SYMBOLS & ICONS, 1 & 2
BUSINESS SYMBOLS COLLECTION
SAFETY & PACKAGING COLLECTION
ACCENTS & ATTENTION GETTERS COLLECTION
ALSO: SPECIAL EDITION VINYL CUTTERS PACKAGES
FAX 802 878-1768 • INFO 802-879-1164
800 255-0562
MasterCard VISA
Innovation Advertising & Design
41 Monsfield Ave • Essex Jct., VT 05452

CIRCLE 566 ON READER SERVICE CARD

Macの日本語はクォリタスにお任せ下さい。
Qualitas is your Japanese Resource!

QuarkXPress 3.11J	MacWord 2.0J
Aldus PageMaker 4.5J	EGWord 5.0
Aldus Freehand 3.1J	SOLO Writer 1.3.2
Adobe Illustrator 5.0J	Excel 4.0J
Adobe Photoshop 2.5J	ATM-J
JapanEase Vol.1	LogoVista E-J
JapanEase Vol.2	Applause E-J

Japanese Language Kit! $249

Qualitas Trading Co.
2029 Durant Avenue, Berkeley, CA 94704
Phone: (510) 848-8080 Fax: (510) 848-8009

CIRCLE 582 ON READER SERVICE CARD

Precision Type FontSampler... version 1.1
57 FONTS FROM 23 FOUNDRIES
TYPE
IN BLACK + WHITE

Just off the press! Our new font catalogue (large format: 11"x 11") with lots of new releases. **free with any order.** Or, you can get your copy for just $6.95 (and that includes free updates) – add $2.50 for the postage and handling. PRECISION TYPE: 47 Mall Drive, Commack NewYork, 11725. 5703. Fax: 516.543.5721. Phone: 516.864.0167 or **800.248.3668**

CIRCLE 485 ON READER SERVICE CARD

Native Application for Power Macintosh

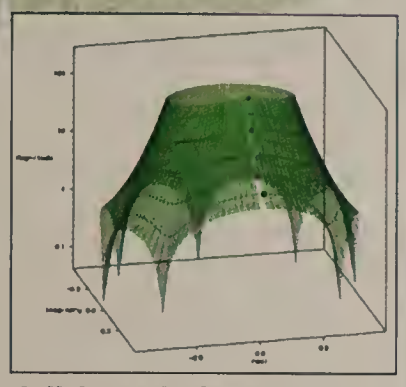
HiQ®
Real-World Math for Macintosh

Notebook Interface
- Interactive analysis and graphics in a WYSIWYG notebook interface
- Insightful 2D and 3D graphics
- Annotation for technical reports, journals, and presentations
- Publication-quality output

Numerical Analysis Power
- More than 600 math, scientific, and engineering functions
- Efficient algorithms with optimal convergence
- User-defined error tolerances

Problem Solvers
- Intuitive GUIs for solving sophisticated problems
- Automatic code generation

HiQ-Script
- A language built for scientists, engineers, and mathematicians



Call for FREE demo,
(800) 433-3488 (U.S. and Canada)

NATIONAL INSTRUMENTS®
The Software is the Instrument®
6504 Bridge Point Parkway
Austin, TX 78730-5039
Tel: (512) 794-0100
Fax: (512) 794-8411

© Copyright 1994 National Instruments Corporation. All rights reserved. Product and company names listed are trademarks or trade names of their respective companies.

CIRCLE 500 ON READER SERVICE CARD

FREE
MAC & IBM SHAREWARE
100 CD SOFTWARE
CATALOG

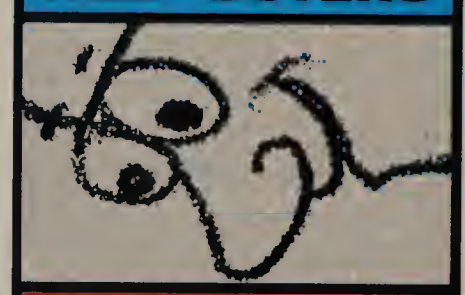
SoftShoppe CD $46 Only!
The Ultimate Shareware Collection
SoftShoppe 32 Pages! ASP Member
POBOX 4437
CERRITOS, CA 90703
TEL: (310)802-1333
FAX: (310)802-1494



1-800-851-8089

CIRCLE 422 ON READER SERVICE CARD

HOT SHOPPER PRODUCT CATEGORIES
HELP BUYERS



FIND THE PRODUCTS
THEY NEED FAST.

ENVISION DESIGNYCENTERS
San Francisco
Los Angeles
New York

COMPUTER-DRIVEN LASER CUTTING



Turn your drawings or computer files into precision laser cut parts for models, prototypes, signage, and graphics!

24 hr. Turn-around Available

For more information call
(800) 466-8811

CIRCLE 451 ON READER SERVICE CARD

Chromascript & Farte
NOW AVAILABLE! Iris & 3-M Rainbow Prints Overnight and Economy Service
Experts in Mac Slide Imaging
Starting at $3.50 per slide
Now Imaging 4x5
Free Shipping*
NEXTWAVE PRODUCTIONS™
24 hr BBS
24/72 hr service
Volume discounts
3-5 hr Immediate svc.
High volume slide duplication
Scanning and production services
*Call for Info
MasterCard VISA AMERICAN EXPRESS
212/989 2727 800/445 9002

CIRCLE 488 ON READER SERVICE CARD

Don't Panic!
"The Data Recovery Experts™"
- Best Success Rate
- Fast Turnaround
- No Recovery—No Fee

Absolute Data Recovery!
TOTAL RECALL™
800.743.0594
2440 Waynoka Rd. • Colorado Spngs, CO 80915
719-380-1616

CIRCLE 458 ON READER SERVICE CARD

DATA RECOVERY

- **Expertise in Macintosh** & virtually every operating system & storage device - including tape & removable media
- **24-Hour Worldwide Support** with on-site, weekend, and priority service
- **Professional Service Authorized** by major manufacturers

Ontrack Data Recovery — World Class Service

Ontrack DATA RECOVERY®
MN: 1-800-872-2599
CA: 1-800-752-7557
London: +44 (0)81 974 5522 • Germany: 0130-815-198 • France: 05 90 72 42
~ Ask about our referral programs ~

CIRCLE 459 ON READER SERVICE CARD

MICRODOC
Macintosh Computer Repair
- Component level repair in less than 48 hours.
- We stock hard to find & custom parts.
- Same day parts shipping & most repairs.
- Telephone tech support on repair kits.
- Complete price list available upon request.
- School and corporate P.O. accepted.
- Dealers/Servicers only.

Serving the service industry since 1983—with great prices on parts and repairs.

CHECK OUT OUR PRICES

REPAIR PARTS
Exact replacement CRT:3 @$50
Exact replacement mouse cables
Complete analog repair kit with docs
Hard drive power supply from $49
Circuit board ICs, fuses & filters

LOGIC BOARD REPAIRS
LaserWriterII NTX - $199
MacII, SE, Classic, & Plus - $99
MacIIX, CX, SI, & ClassicII - $119
MacIICI, FX, & Quadra 700 - $179
Powerbooks from $119
Floppy drive repairs 800/1.4 - $69/$99

Prices are subject to change

1040 Tyinn #7/Eugene, OR 97402/(503) 344-5335/FAX (503) 344-5020

CIRCLE 482 ON READER SERVICE CARD

SlideImagers®
- Slides & Overheads
- Kodak PortFolio Services
- Dye-Sub Output
- Large Color Posters
- Canon Fiery Lasers
- Slide Duplication
- 4x5 Neg/Pos/B&W
- Data Transfer to CD-ROM
- 48 Hour,$3.00 a slide

Overnight $4.95 Slides & Canons
Digital Output
PhotoCD™ Scans $.90

(800) 232-5411
22-7th St. • Atlanta, GA 30308 • 404-873-5353

CIRCLE 456 ON READER SERVICE CARD

SERVICES & SUPPLIES
PROGRAMMING & UTILITIES

Macworld SHOPPER®

Data Recovery Service
CPR & RS has been recognized in national magazines for its data recovery techniques. With the use of our custom software and hardware, data has been recovered from Mac's, PC's, Power Books and Laptops, on all drives and all types of failures with 98% success. No minimum or eval. fees. Let the company that trains the Pro's Recover your Data. Software and Training Available. Saving Data since 1983.
C.P.R. & Recovery Services, Inc.
11440 Okeechobee Rd. #201
Royal Palm Beach, FL 33411
800/765-9292 407/795-7266

MAC REPAIR
Mac Shop Northwest

- Apple™ Certified Technicians
- One-Day Service Turnaround*
- Hard Disk Repair & Data Recovery
- Up to 75% below Dealer Rates
- Component-Level Repairs
- Expert Advice and Prices by Phone
- Power Supplies & Logic Boards
- Lifetime Repair Warranty*

Tel: 1-503-642-3456
*on many repairs. Visa/MC/AX. *Fast* overnight shipping available. We use genuine Apple™ parts.
FEDERAL EXPRESS
1-800-MAC-SHOP

CIRCLE 515 ON READER SERVICE CARD

SAFEWARE
Insures Your Computer

The Computerowners℠ Policy insures you against **theft, fire, accidental damage, lightning even power surge!** Replace or repair for $49 a year. Available in the U.S. & Ontario.
1-800-800-1492
SAFEWARE, The Insurance Agency Inc.
2929 N. High St., PO Box 02211
Columbus, OH 43202

CIRCLE 522 ON READER SERVICE CARD

Notebook Thefts Skyrocket!
Why Take the Risk?

NOW "Insurance to Go"℠

The Risks	The Insurance
Theft - Fire	Premiums Start at
Power Surge - Lightning	$60 a Year
Earthquake - Accident	

1-800-722-0385
The Computer Insurance Agency, Inc.
6150 Old Millersport Rd. NE • Pleasantville, OH 43148

CIRCLE 523 ON READER SERVICE CARD

DRIVESAVERS® DATA RECOVERY

"If it hadn't been for DriveSavers, our data would have been lost forever."*

As the only all-Mac data recovery company, we've saved more megabytes of Mac data than anyone else in the world. We're certified by every Mac drive manufacturer. Our proprietary techniques are so advanced we can rescue data others might simply abandon.

1-800-440-1904 Restoring data–and peace of mind–since 1989
400 Bel Marin Keys Boulevard • Novato, California 94949 • Phone: 415-883-4232 *–S.S., Sebastopol, CA

CIRCLE 510 ON READER SERVICE CARD

Process Color Printing on Demand

Print your files in brilliant four color process for less than the cost of color laser copies.

- **Direct from your Postcript files**
- **Imaged at high resolution**
- **24-hour service available**
- **Brochures, posters, fliers Call today for pricing on your design**

We offer complete Digital Imaging, Scanning, Prepress Services, Printing & Finishing.

PHONE 1-800-714-4747 FAX 1-800-417-4747
MODEM 1-800-755-4747

653 11th Avenue
New York, NY 10036
Tel. 212-581-7470
Fax 212-581-6218

Stevens Press Total Graphic Services

CIRCLE 588 ON READER SERVICE CARD

The Economical Inkjet Printer Refill from DGR


The JetInk™ is the only economical and reliable cartridge refill solution for inkjet printers.
$15.99 Black Twin Pack
plus shipping & handling other printer prices vary
DGR Technologies
Tel (512) 476-9855
Fax (512) 476-6399
1219 W. 6th Street Ste. 205
Austin, TX 78703
1-800-235-9748

CIRCLE 593 ON READER SERVICE CARD

DIGITAL IMAGING

Slides	$3.75
4x5 chromes/negs	$16
Dye sub print/overhead	$18
Hi Res Scanning	$10

Quantity Duplication on Slides and Overheads
Show & Tell
39 W. 38th St., NY, NY 10018
212 840 2912 • 212 840 7953 (fax)

CIRCLE 550 ON READER SERVICE CARD

MACTRAN PLUS Ver.4.5
Sys 7 Comp INTEGRATED Made-for-Mac Devel System, Incl: Editor, Optimizing Compiler, Source level Debugger, Linker, Library Mngr, Profiler and Build Facility. Supports 68020/030/040 & 68881/2 native code. Significant Vax Fortran & ANSI 8x exts. High and Low Level tool box interface. Unltd Code seg size. *"I use it at home on my MAC II, on a Quadra in my Lab and on a Powerbook while traveling" Ole Vilman, Consultant Engineer.*
DCM Data Products
1200 Quail St, #280
Newport Beach, CA 92660
714-724-0802/1021
714-724-0803 FAX

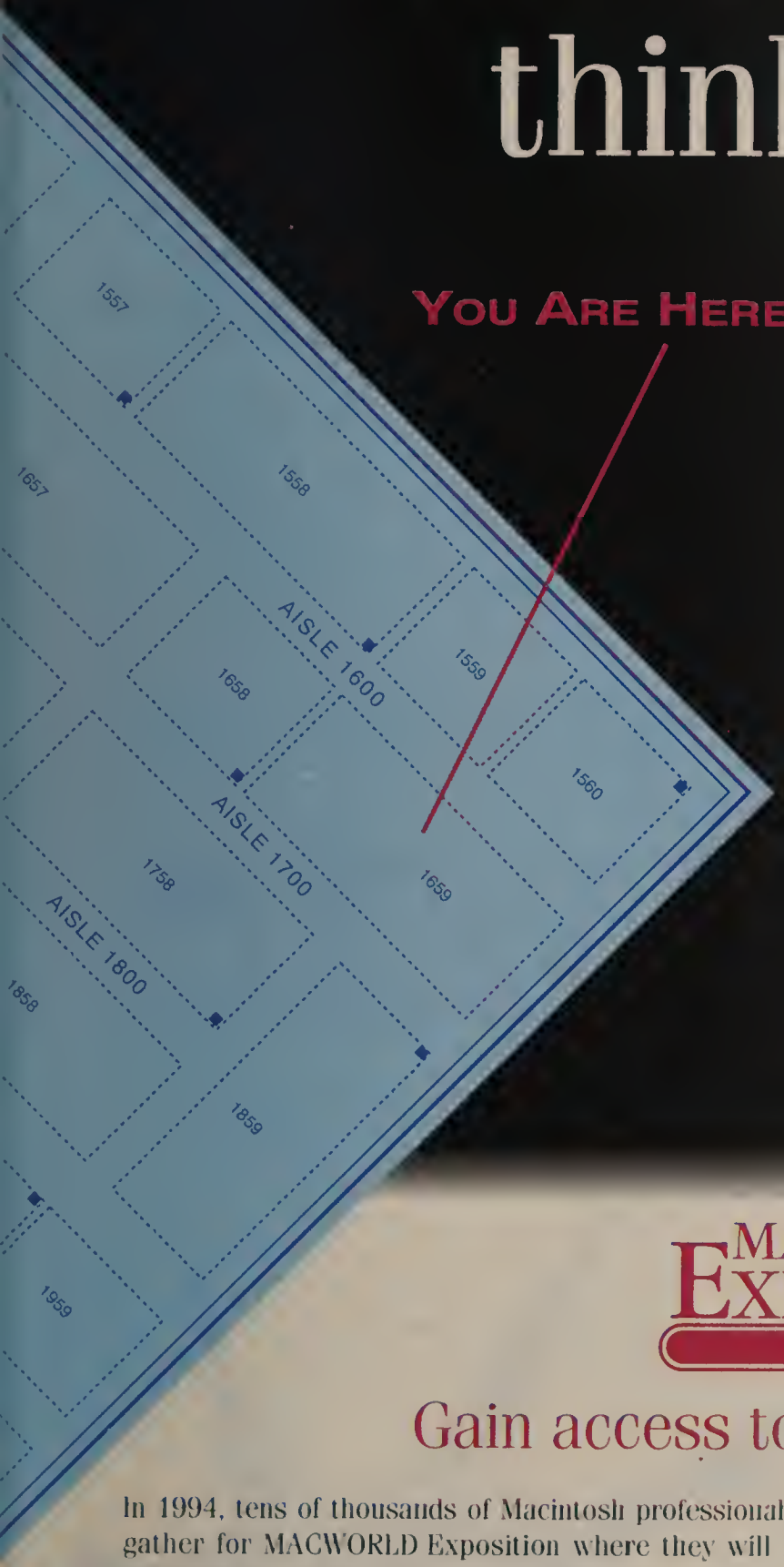
We can scan your 35MM slides & negs onto Photo CD
24 Hr Turnaround
as low as **60¢** an image
Photo CD™
1-800 WRITE CD
800-974-8323

CIRCLE 502 ON READER SERVICE CARD

$19.00!!!
For all repairs plus parts and shipping. Maximum price guaranteed. Super fast turn-around. New and used hardware for sale. School orders welcome. Open 12 noon-5, 6:30-10pm eastern M-Sat. We buy dead Apples, Macs, PCs.
Arminius Pubs. & Prods. Inc.
8519 Orchard Ave.
Merchantville, NJ 08109
609/662-3420

FORTRAN 77 • System 7
LS FORTRAN is an ANSI/ISO standard FORTRAN 77 compiler for the Macintosh. Supports extensions from VAX and Cray FORTRAN, built-in debugging, background execution, software or hardware floating point, optimized code generation, and 2D or 3D graphics support. The complete solution to your FORTRAN programming needs.
Language Systems Corp.
P.O. Box 140
Sterling, VA 20164
703/478-0181 703/689-9593 Fax
800/252-6479
See us at Macworld D.C. EXPO Booth #741

If you think you just get some floor space, think again.



YOU ARE HERE...

...AND HERE



MACWORLD EXPOSITION

Gain access to a world marketplace.

In 1994, tens of thousands of Macintosh professionals will gather for MACWORLD Exposition where they will make decisions about what products and services they'll buy now and in the coming year. Based on what they see and learn at MACWORLD Expo, they'll decide how to expand their system to expand their world.

MACWORLD Expo/Boston – August 2-5, 1994

MACWORLD Expo/Canada – October 18-20, 1994

MACWORLD Expo/San Francisco – January 4-7, 1995

Reserve your booth space today for MACWORLD Exposition and see how some floor space can turn the world into your marketplace.

Please send me more information on MACWORLD Expo.
I am interested in exhibiting in:
❑ Boston ❑ Canada ❑ San Francisco

Name _____

Title _____

Company _____

Address _____

City/State/Zip _____

Phone _____ Fax _____

Mail to: Mitch Hall Associates
260 Milton Street, Dedham, MA 02026

Or Fax to: 617-361-3389 Phone: 617-361-8000



Keep the Flame Alive

The lamp of freedom and the light of learning can take many forms.

Your company's used computers, laser printers, modems, and other surplus equipment can help empower young minds in America, and advance the development of emerging democracies around the world.

The East West Foundation takes your surplus or used equipment and distributes it to American schools and charities and to democratic and educational institutions in Eastern Europe, Africa, Asia, the Commonwealth of Independent States, and Latin America—wherever it can make a difference. And it *does* make a difference.

Donating used or overstock computer equipment to the East West Foundation can make a difference to you, too—at the bottom line. Because all donations are tax-deductible. And all types of computer equipment are welcome.

To arrange for a donation or for more information, please call:

EastWestFoundation
49 Temple Place
Boston, MA 02111
(617) 542-1234
Fax (617) 542-3333

EAST WEST
EDUCATIONAL DEVELOPMENT FOUNDATION

A Not-For-Profit Corporation



This magazine's got your name, your rank and your number.

The better we know you, the better our chances of writing articles you'll find relevant and useful. The same holds true for our advertisers.

Knowing who you are (your name, job title, company and industry) enables them to more easily develop messages with your informational requirements.

Circulation information helps advertisers determine who you are, what to say and where to say it. And since advertisers support our publication and allow us to keep bringing you high quality editorial, we think they deserve the most reliable and current circulation facts and figures available.

BPA International helps us provide it. An independent, not-for-profit organization, BPA International audits our circulation list once a year to verify that it's accurate and up to date.

The BPA International audit makes sure our advertisers get the readers they pay for. And when advertisers get the readers they pay for, chances are they get the results they pay for, too.

BPA International. Circulation Intelligence for Business & Consumer Media.

270 Madison Avenue, New York, NY 10016, 212-779-3200.

BPA
INTERNATIONAL

Guaranteed lowest prices every day!



THE BEST DEAL IN CLIP ART

CLIP ART CD

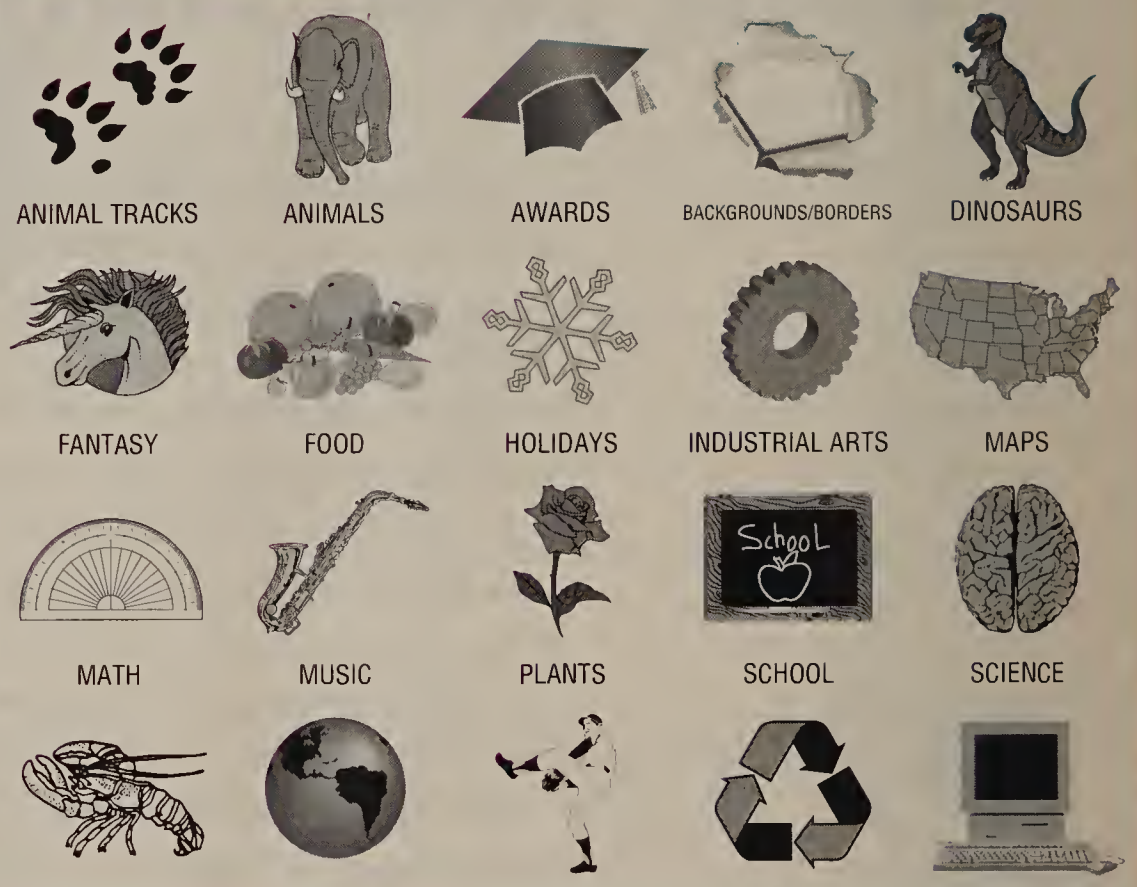
"I have purchased over 15 different clip art collections, and yours is truly the best!"

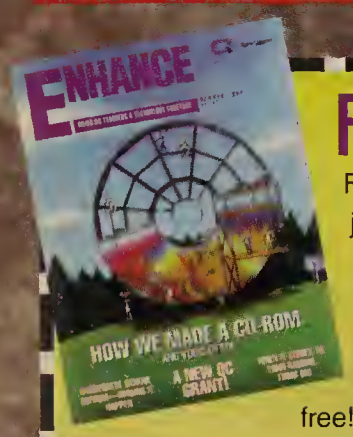
—Scott Goldstein

- Over 1200 high quality curriculum-oriented images, borders, and more!
- 20 different categories
- Pictorial Index & Catalog included
- PICT & EPS formats
- Easy-to-use
- 30 Day Money Back Guarantee
- Preferred choice of educators

ONLY $49.95

Also available on 3.5" diskettes. Ask for details!





FREE EDUCATIONAL CATALOG

Find out why Enhance is America's favorite journal & catalog of educational technology. Four times per year, over 250,000 teachers look to Enhance for grant writing tips, technical advice, product reviews, and success stories from across the country. Enhance is free! Call today, or clip and mail this order form.

Name _____

Address _____

City _____ State _____ Zip _____

Phone (_____) _____

Occupation: ❑ Educator ❑ Other _____

QUALITY COMPUTERS

Title _____

MacWorld Quality Computers • 20200 Nine Mile Rd. • St. Clair Shores, MI 48080

ORDER NOW AND GET



BONUS CD

WITH EVERY ORDER

The Q-ROM

Software Demos • Educational Games

Entertainment Games • Fonts

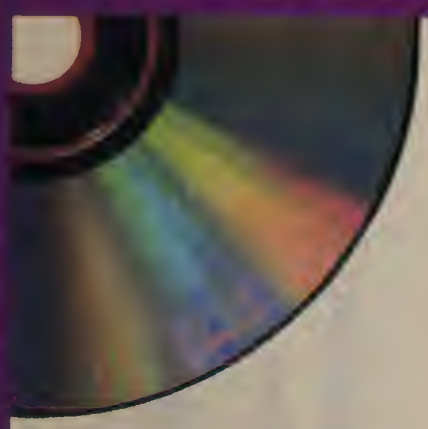
QuickTime Movies • Clip Art • Much more!

Tenth ANNIVERSARY

Find out what makes Quality Computers the leader in Educational Technology across America!

Educator's Shopping Guide!

FREE CD-ROM W/EVERY ORDER!



CD-ROMS



BRODERBUND
- Arthur's Teacher Trouble 34.95
- Carmen World Deluxe 49.95
- Just Grandma & Me 34.95
- Myst 47.95
- New Kid on the Block 34.95
- Tortoise and the Hare 34.95

DISCIS BOOKS—CLASSROOM VERSIONS
- Aesop's Fables 24.95
- Cinderella 24.95
- Mud Puddle 24.95
- Scary Poems for Rotten Kids 24.95
- Tale of Benjamin Bunny 24.95
- Tale of Peter Rabbit 24.95
- Thomas' Snowsuit 24.95



ORANGE CHERRY NEW MEDIA
- 20,000 Leagues Under the Sea 39.95
- Adventures of Pinocchio 39.95
- Beauty and the Beast 39.95
- Talking Classic Tales 39.95
- Talking Jungle Safari 39.95
- Time Traveler 59.95
- Wind in the Willows 39.95

SOFTWARE TOOLWORKS
- Capitol Hill 29.95
- Oceans Below 29.95
- San Diego Zoo: The Animals! 39.95
- Space Shuttle 29.95
- U.S. Atlas v.3.0 ..... 39.95
- World Atlas 3 Multimedia 39.95

TIMEWORKS
- Publish It! Easy 3.0 ..... 49.95

WAYZATA
- World Factbook 24.95
- CD-Fun House 24.95

SOFTWARE



BRODERBUND
- Balance of the Planet 39.95
- Carmen America's Past 29.95
- Carmen Time 29.95
- Carmen World 24.95
- Kid Pix 34.95
- Kid Pix Companion 24.95
- Print Shop Deluxe 47.95
- Spelunx/Caves of Mr. Seudo 28.95
- The Backyard 29.95
- The Playroom 29.95
- The Treehouse 34.95

CLARIS
- ClarisWorks Competitive Upgrade 99.95

DAVIDSON
- Kid Works 2 ..... 34.95
- Math Blaster Mystery 29.95
- The Cruncher 34.95
- Zoo Keeper 34.95

EDMARK
- Bailey's Book House 28.95
- KidDesk 24.95
- Millie's Math House 28.95
- Thinkin' Things 32.95

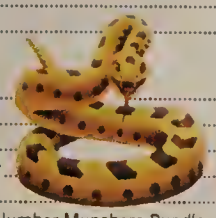
INTUIT
- Quicken 44.95



LAWRENCE PRODUCTIONS
- Discovering America 34.95
- Nigel's World 27.95
- The Lost Tribe 29.95

LEARNING COMPANY
- Bilingual Writing Center 169.95
- Math Rabbit 1 ..... 34.95
- Math Rabbit 2 ..... 34.95
- Reader Rabbit 1 ..... 34.95
- Reader Rabbit 2 ..... 34.95
- Reader Rabbit's Ready for Letters 34.95
- Super Solvers Midnight Rescue 34.95
- Super Solvers Outnumbered 34.95
- Super Solvers Spellbound 34.95
- The Writing Center 49.95
- Treasure Math Storm 34.95

MAXIS
- SimCity 2000 ..... 39.95
- SimEarth 32.95
- SimFarm 34.95
- SimLife 29.95



MECC
- Amazon Trail 34.95
- DinoPark Tycoon 34.95
- My Own Stories 29.95
- Odell Down Under 34.95
- Oregon Trail 28.95
- Super Munchers/Number Munchers Bundle 29.95
- USA Geograph 28.95



MICROSOFT
- Creative Writer Academic 39.95
- Fine Artist Academic 39.95
- Microsoft Word Academic 84.95
- Microsoft Works Academic 99.95

QUALITY COMPUTERS
- SmartStart 49.95
- SmartStart Pro Version 79.95
- SmartVoice 49.95

ROGER WAGNER
- HyperStudio 2.0 ..... 109.95



SYMANTEC
- Norton Utilities 2.0 Academic 74.95
- SAM 3.5 Academic 44.95

TIMEWORKS
- Publish It! Easy 3.0 ..... 49.95

WEEKLY READER
- Stickybear's Early Learning Activities 34.95
- Stickybear Math Town 34.95
- Stickybear's Reading Room 34.95

HARDWARE



APPLIED ENGINEERING
- TransWarp 4340 ..... 379.95
- TransWarp 2325 Mac Classic 189.95
- TransWarp LCIII 50 MHz 389.95
- TransWarp SE 1325 ..... 199.95

DIGITAL VISION
- ComputerEyes (B&W) 199.95
- ComputerEyes (Color) 299.95
- ComputerEyes RT 399.95



E-MACHINES
- Simply TV 399.95

HEWLETT PACKARD
- ScanJet IIcx 999.95
- ScanJet IIp 729.95

LAPIS TECHNOLOGIES
- Lapis SCSI Dock 179.95
- LTV LV 289.95
- LTV Portable 349.95

LOGITECH
- FotoMan Plus 549.95
- ScanMan Model 32 w/CatchWord Pro 249.95



QUALITY COMPUTERS
- Q Drive 60 MB 199.95
- Q Drive 170 MB 349.95
- Q Drive 270 MB 499.95
- Q Drive 340 MB (Conner) 499.95

SUPRA
- SupraFAXModem 144LC 169.95

SPECIAL • SPECIAL • SPECIAL • SPECIAL

CLARISWORKS 2.1 COMPETITIVE UPGRADE



Upgrade from any "Works" program to ClarisWorks, the highly rated integrated Macintosh program. ClarisWorks features: Word Processing. Dictionary & Thesaurus, Multiple Column Layout, Text/Graphics Rotation, WYSIWYG Display, Import & Export, Spreadsheet, Database, Mail Merge, Communications and much more!

$99.95

SPECIALS

SCANMAN MODEL 32 W/CATCHWORD PRO

$249.95



THE BACKYARD

$29.95

SUPRA FAX MODEM 144LC



$169.95



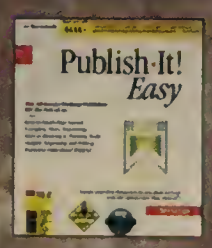
PRINT SHOP DELUXE

$47.95

SAN DIEGO ZOO: THE ANIMALS

$39.95





PUBLISH IT! EASY 3.0

$49.95

SUPER MUNCHERS/ NUMBER MUNCHERS BUNDLE

$29.95



WHO WE ARE. Quality Computers has been a leader in the educational technology market for 10 years. When we started, everyone used Apple II s. Today, schools are using more Macs and PCs. But no matter what kind of computers schools use, we will be there to provide their needs. Call for your free catalog and issue of our educational newsletter

IF YOU DON'T SEE A PRODUCT THAT YOU NEED, CALL FOR OUR COMPLETE CATALOG

WE WILL MEET OR BEAT ANY NATIONALLY ADVERTISED PRICE!

MENTION CODE MW64 WHEN ORDERING

VISA · DISCOVER

SCHOOL P.O.S BY PHONE, FAX OR MAIL

1-800-777-3642

Quality Computers™

20200 Mac Mile Rd. • St. Clair Shores, MI 48080 • 81...774-7206 • F... 810-774-96...

The cutting edge of Mac technology!

SMARTVOICE

Give your Mac a clear, natural voice with SmartVoice

- Reads any text in any program
- Add speech to your favorite word processor
- Great for proofreading—find out how your writing REALLY sounds
- Works in the background so you can work while your Mac reads
- Comes with 14 unique voices, a talking computer psychiatrist, talking text editor, talking clock, talking calculator, and more fun extras
- Uses Apple's new PlainTalk™ technology
- Comes bundled with Apple's SpeechManager™, MacinTalk 2™, and MacinTalkPro 2™*
- High-quality synthesized speech with realistic inflection and tone
- Speaks notification boxes from the Finder



HEAR APPLE'S PLAINTALK TECHNOLOGY FOR YOURSELF!

CALL 1-800-MAC-YACK!

1-800-622-9225

LISTEN ALONG WITH OUR SMARTVOICE DEMONSTRATION:

"If computers could talk, imagine the things they'd say! Welcome to the SmartVoice demonstration! The most powerful speech utility for your Macintosh. SmartVoice works within your word processor, so you can have your letters read back to you to check for clarity. SmartVoice brings the Power of speech to your Macintosh! Now you can see and hear the text on your screen . . ."



SmartVoice.....49.95



Crank It Up with Labtec Speakers.....24.95
Labtec Shielded Mini-Speakers for full-range voice reproduction. Batteries or adapter required.

Talking Software.....39.95 ea
Early Learning made fun through the power of speech synthesis! Three colorful packages available: Math, Phonics, and Music.

All require Speech Manager and MacinTalk 2 or MacinTalkPro 2 (included with Quadra AV models, or available separately with the SmartVoice package)

*MacinTalk 2 requires Mac Plus or better with System 6.0.6 or later and uses about 150K RAM. MacinTalkPro 2 requires Mac LC or better running System 7.0 or later and uses between 700k and 2.8 MB RAM depending on the voice selected.

High-quality voices require the use of MacinTalkPro 2.

™ "Apple," "MacinTalk," and "PlainTalk" are trademarks of Apple Computer, Inc.

FREE CD-ROM W/EVERY ORDER!

MENTION CODE MW64 WHEN ORDERING

VISA MasterCard DISCOVER AMERICAN EXPRESS Card

SCHOOL P.O.S BY PHONE, FAX OR MAIL

1-800-777-3642

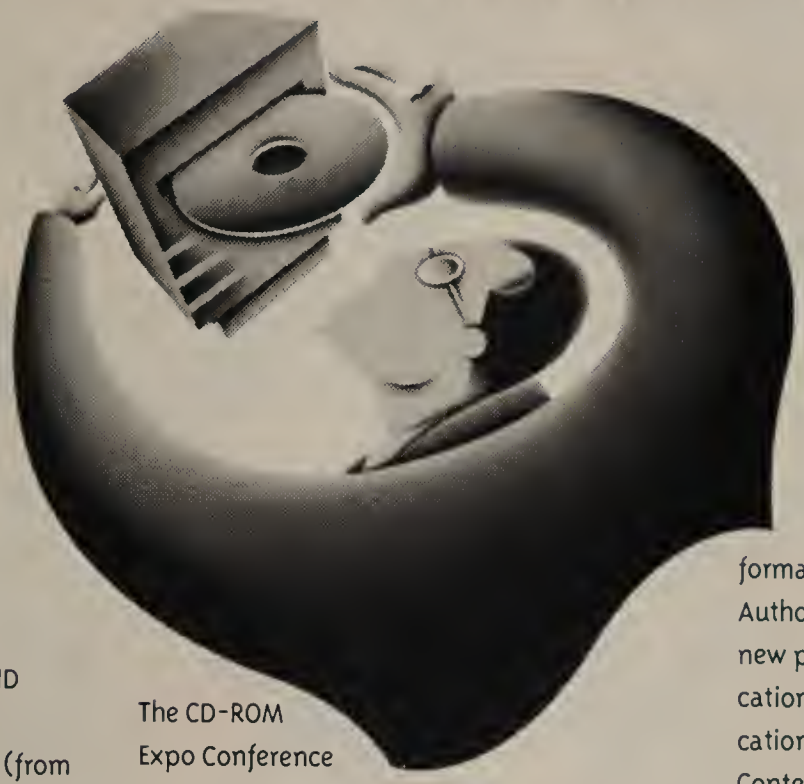
Circle 263 on reader service card

Quality Computers ™

20200 Nine Mile Rd. • St. Clair Shores, MI 48080 • 810-774-7200 • Fax 810-774-2698

The 1994 CD-ROM Expo: Profiting From Digital Publishing

October 5-7, 1994 • World Trade Center • Boston, MA



With The Endless Opportunities That CD-ROM Provides...

CORPORATIONS ARE SLASHING COSTS AND multiplying their profits with CD-ROM for advertising and sales presentations (from catalogs to kiosks), records management, technical product support, documentation, and training.

GOVERNMENT IS DRASTICALLY REDUCING the cost of printing, storage and distribution of databases via CD-ROM.

EDUCATORS — IN SCHOOLS, LIBRARIES, AND museums — are turning their analog assets into digital dollars.

THE PRINT-PUBLISHING INDUSTRY — including books, magazines, and newspapers — is expanding to profitable new horizons with CD-ROM's ability to capture and disseminate information at a fraction of historical print costs.

ENTERTAINMENT INDUSTRIES ARE PROFITING from an expanded ability to reach untapped audiences in the consumer market, thanks to CD-ROM technology.

The CD-ROM Expo Conference will feature first-hand success (and horror!) stories from all these communities, including valuable lessons learned in the production and marketing/distribution of CDs.

If You Would Like to Publish a CD...

Don't begin before you've learned how to enjoy the benefits while avoiding the pitfalls!

If You Are Publishing a CD...

Are you sure you're taking fullest advantage of the CD-ROM tools and techniques that can help you accomplish more in less time, with fewer complications, smaller margin for error, and greater opportunity for profit?

At the CD-ROM Expo Conference, You Can Learn About...

Successfully publishing and marketing a CD • Maximizing multimedia in CD-ROM production • Coping with multiple platforms and formats • Copyright and licensing issues • Authoring and development tools • Emerging new production techniques • Interactive application design • Networking multimedia applications • Text retrieval and development • Content asset management and exploitation • Strategies for defining markets • Industry trends and developments, including portable and wireless communications • Pricing/promotion/ advertising in new markets • Financing CD-ROM titles • New distribution channels • Creating/converting data to digital form • Transitioning from print and on-line to CD-ROM • Legislative initiatives • Where to find digital talent • In-house CD-ROM production and distribution vs. outside services • Using standard digital formats for different kinds of data... and more.

If You're Interested in CD-ROM Titles For Home, School, or Business Use . . .

The exhibit floor at CD-ROM Expo will dazzle you with a fabulous array of titles, bringing a universe of information, entertainment, and education to your desktop!

Yes, I'd like more information about the 8th annual CD-ROM Expo October 5-7, 1994. I'm interested in: ☐ exhibiting ☐ attending

NAME_____ TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____ ZIP_____

TELEPHONE_____ FAX_____

Send to: CD-ROM Expo '94, 260 Milton St., Dedham, MA 02026 or fax to: 617-361-3389

MACWORLD

Join the CD-ROM Revolution!



All drives are ready to run and are Kodak multisession compatible. Driver software and cable included. Specify #981 MAC to SCSI or #982 SCSI to SCSI cable (except NEC).

CD-ROM Drives

Buy a CD-ROM drive from us, and add a bundle up to 90 days after purchase!

CD Tech-4100A $359
#5100—AT-320ms/DTR-300k/sec

CD Tech-T3401 $479
#1824 —AT-2[illegible]0ms/DTR-327k/sec

Pioneer DRM604X $1299
#978—AT-300ms/DTR-612k/sec

Plextor DM5028 $429
#5028—AT-245ms/DTR-335k/sec

NEC 3Xp $469 (portable)
#944—AT-250ms/DTR-450k/sec

NEC 3Xe $597 (external)
#945 —AT-200ms/DTR-450k/sec

*FREE Express Shipping!

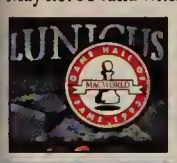
Free Express (2-day) Shipping only on products in this ad marked with a star: *



3 FREE CDs



FREE Lunicus, Mister X & the EDUCORP CD Sampler with a CD-ROM drive or drive bundle purchase from EDUCORP.
May not be valid when price matching. You get:



Lunicus
★★★★1/2 "The King of CD-ROM Adventure.." *MacUser* (MSRP $69.95)



Mister X
An animation-enhanced volume of the Mister X comic book series. (MSRP $19.95)



EDUCORP CD Sampler
Over 100 demos of the newest and best-selling titles. (MSRP $9.95)

CD Bundles

Education Bundle

Includes drive, Labtec speakers with A/C adapter, stereo headphones, choice of SCSI cable, driver software and power supply.

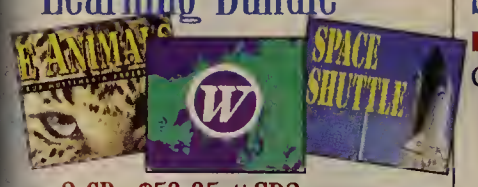
1. Grolier's Encyclopedia ...*Retail* $395.00
2. World Atlas.....69.95
3. U.S. Atlas.....69.95
4. U.S. History.....395.00
5. Think for Yourself.....249.00
6. The View from Earth.....79.95
7. Dictionary/Living World 3.0.....149.00
8. Mayo Clinic Family Health Bk.....69.95
9. Shakespeare.....29.99
10. Sherlock Holmes.....29.99
11. Audubon's Birds of America.....49.99
12. Audubon's Mammals.....49.99

E5028 Plextor DM5028 .....$649
E5100 CD Tech-4100A 569
E1824 CD Tech-T3401.....699
2 FREE multimedia titles with CD Tech.
E945 NEC 3Xe 829
E944 NEC 3Xp.....679

Optional Bundles

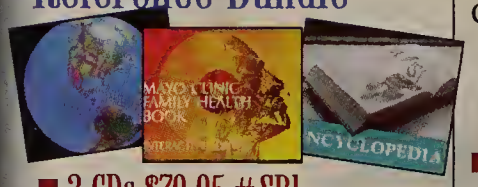
You must purchase a drive or drive bundle from EDUCORP.

Learning Bundle



■ 3 CDs $59.95 #SB2
Save $119.90 (Total retail value $179.85)
1. Space Shuttle.....49.95
2. Multimedia CIA World Fact Bk....29.95
3. The Animals!.....99.95

Reference Bundle



■ 3 CDs $79.95 #SB1
Save $454.95 (Total retail value $534.90)
1. Grolier's MM Encyclopedia.....395.00
2. World Atlas.....69.95
3. Mayo Clinic Family Health Book 69.95
Combine bundles for extra savings!

Save A Bundle!

■ 3 CDs for $39.95
Choose from 7 CDs including:
B37. 12 Roads to Gettysburg.....$29.95
B40. Goferwinkel's Adventure.....29.95
B49. Animal Alphabet.....59.00

■ 3 CDs for $49.95
Choose from 10 CDs including:
B1. World Atlas.....69.95
B4. Desert Storm.....39.99
B26. The Orchestra**.....79.98

■ 3 CDs for $69.95
Choose from 18 CDs including:
B41. Space Shuttle.....49.95
B43. Encyclopedia of Life.....79.95
B45. Lunicus**.....59.95
B53. Oceans Below.....49.95

■ 3 CDs for $124.95
Choose from 9 CDs including:
B2. Grolier M/M Encyclopedia.....395.00
B31. Guinness Disc of Records.....79.95
B32. Mayo Clinic Family Health Bk69.95
Call for a complete list.
**Excluded from the 90-day offer.

Over 600 CD's In Stock

1818 CD Sampler 9.95
50329 Clip Art Sampler ..9.95

Educational

50110 Encyclopedia of Dinosaurs*.....$49.95
"..a tour de force of the prehistoric world. It's potential is wonderful, the ease of use is excellent, and above all, it's fun to use!" *Sweetwater Union H.S.* Hundreds of illustrations, animated diagrams and video.

1280 Encyclopedia of Life*...64.95
An exciting multimedia reference to life on our planet! A quarter million words, QuickTime videos and award-winning color photos.

2078 Animal Alphabet 29.95
Select an animation, QuickTime video, or narrated sentence.

ZooGuides Series
"...a series of beautiful interactive zoo discs." *MacUser Magazine*
Each ZooGuide is filled with interactive video, photos, narration, animation, distribution maps and a guide to families and species.

2081 Butterflies/World.....$39.95
Zooguide v.1. Explore 15 families.
1210 Whales & Dolphins.....39.95
Zooguide v.2. MacUser Top 50.
1275 Mammals of Africa 39.95
Zooguide v.3. Take an African safari!
50300 The Rainforest.....39.95
Zooguide v.4.

Entertaining Multimedia

50319 Freak Show.....48.95
2094 Comic Bk Confidential 34.95
2095 A Hard Day's Night..27.95
Rated ★★★★★ *MacUser Magazine*

50318 Short Attention Span Theater: It's All Relative 39.95

Stock Photography

Photo CD

The titles below have at least 100 royalty-free photographs and are in Kodak Photo CD format.



1444 Pro Photo Collection* $54.95
50150 Essential Bckgrnds*....49.95
1297 Creative Back/Tex.* 79.95
50048 Best of People/Bus.* ...79.95

Editable EPS

1680 Graphtec Graphic Designs 2.0*.....$49.95
Over 800 color & b/w professional EPS images you can edit: animals, borders, business, flags, holiday, people, and more.

1819 Funny Business* 49.95
Increase sales with 100 royalty-free funny cartoons by the world's top artists.

1274 Trick of Light.....79.95
150 high quality photographic royalty-free backgrounds for print, video & multimedia.

50073 Design Toolkit Pro* 79.95
Over 3800 color & b/w EPS design elements for desktop publishing, multimedia, and presentations; textures, patterns, tiles, fonts, creative caps, borders, backgrounds, and more!

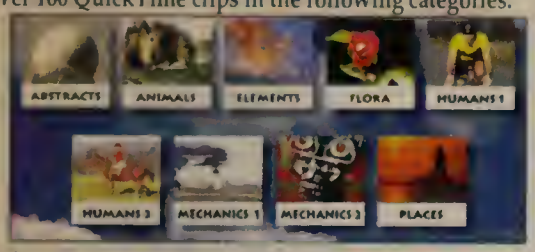
50277 GraphicIMPACT!* 99.95
Over 695 color & b/w EPS elements.

Ad Background created using Professional Backgrounds #50204, $64.95

CD-ROM Showcase

50377 World of Motion.....$34.95

Over 100 QuickTime clips in the following categories:



1564 Wayzata World Factbook $24.95



1994 Edition. Journey around the globe! You'll find detailed high quality photos, in-depth information from the State Department, CIA, or travel advisories.

Published by Wayzata

1385 Right Images.....$159.95

STARS • PLANETS • ASTRONAUTS • • NEBULAE • SHUTTLES •

"The best and most comprehensive commercial collection..."

Publish Magazine

[illegible] naturally react to these [illegible] images. Unlimited reproduction rights on over [illegible] photographs.

[illegible]ished by Tsunami Press

1300 EDUCORP Shareware* $149.00



This 2-CD set is filled with 100's of new & updated programs. Over 1 gigabyte of the best public domain and Shareware software. There's something for everyone! You'll find tons of useful programs in the categories of: education, business, productivity, utilities, games, fonts and clip art. Plus, you get a browser, tutorials, a printed catalog and technical support. System 7 optimized. $50 off with a CD-ROM drive purchase from EDUCORP.

Published by EDUCORP

We'll BEAT any advertised price on CD-ROM products! (some restrictions apply)

Up to 75% OFF Retail



L1774 I Photo. to Remember $14.95

Pedro Meyer shares his parents last years together with photos, narrative, and music.Macworld Top 10.

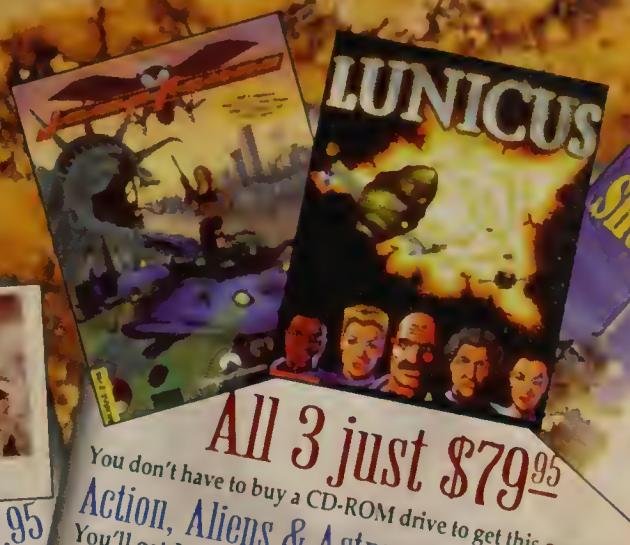
L1771 Baseball's Greatest Hits 19.95

Reminisce with yesteryear's greatest baseball legends.

L1777 Mozart: Dissonant Quartet ..16.95

Performed by the famed Angeles Quartet.

Published by Voyager



All 3 just $79.95

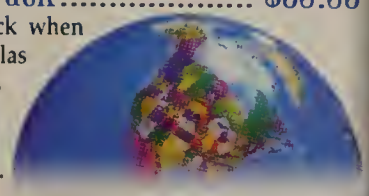
You don't have to buy a CD-ROM drive to get this great price.

Action, Aliens & Astronauts! $79.95

You'll get *Jump Raven* "Edu-tainment with a gun," *Lunicus* "The King of CD-ROM Adventure" and *Space Shuttle* Rated ♦♦♦♦ MacUser Top 50. Use code #GB1

84 Atlas Fun Pack..... $59.95

FREE Lucas Game Pack when you buy the World Atlas and U.S. Atlas. Access detailed color maps and then play 3 animated color games.





50137 Marsbook* $17.95

"1993 Award of Excellence" *New Media*. 3D graphics and animation take you on a walk through the proposed Mars Habitat. The interface informs you of the various functions planned for the base.

Published by Gazelle Technologies

50225 CD AllCache $53.95



High performance CD-ROM drive acceleration software. Make your CD-ROM drive unbelievably fast with CD AllCache. Optimizes drive performance—searches, seeks and opening of files and folders. Manually adjust cache sizes or click on the button, and the data cache settings will be optimized automatically. Enjoy AllCache's Audio DA and listen to your favorite music while you work. Corporate and site licenses available.

Published by CharisMac Engineering

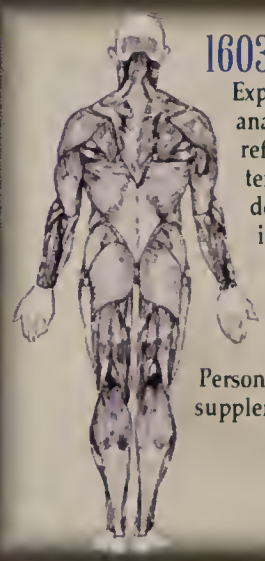
1450 Instant Buttons & Controls $149.95

For Macromedia Director users! Over 500 buttons and controls for multimedia. Save time and money, just copy and paste. Designed by a team of veteran multimedia producers. For kiosks, presentations, training programs and more. Sold worldwide to NASA, Northrop, Apple, Seiko, Amgen and others.



Published by stat media

1603 Anatomist...$249.00



Explore the details of human anatomy with this convenient reference. Included are anatomical terms, over 500 illustrations, notes describing and elaborating on the illustrations, and more than 2400 spoken terms. Medical and life science students will make extensive use of the text that accompanies the diagrams. Personal notes can be added to supplement the existing information.

Published by Folkstone

2090 Small Blue Planet $59.95



Rated ♦♦♦♦ 1/2 *MacUser Magazine*

This interactive exploration is a global geographic voyage so fun and engaging you'll be surprised how much you learn along the way. The Maps that Move interface is your conduit to our Small Blue Planet. Cruise and zoom over The Real Picture Atlas' spectacular imagery—These are real pictures!

Published by Now What Software?!

• *Brush up on geography while you browse its series of maps showing vital physical and political data.*

50316 Midnight Stranger $59.95

"This is a landmark product that should be in the Smithsonian Institute." *Glenn J. Collyer SFSU*

ADULTS ONLY! The first interactive title to employ *Virtual Intimacy.*™ You'll interact with 18 different characters as you roam freely between 23 different locations. Each character speaks to you and invites a response. You guide the direction of the conversation and may become involved in events that might turn violent, sensual, criminal, bizarre or amusing. You become part of the plot.

Published by Gazelle Technologies



Free Catalog!

If you don't see the CD-ROM title you want, chances are, we have it! Call for your free color catalog. (Foreign customers send $4 postage & handling)

The Multimedia Pioneer℠

Prices subject to change without notice. Dealer Inquiries Welcome.

EDUCORP 1-800-843-9497

Order toll-free in U.S. & Canada.

W26

7434 Trade Street • San Diego, CA 92121 • Info 619-536-9999 • FAX 619-536-2345

Kodak Photo CD is a trademark used under license.

Circle 157 on reader service card.



WISE GUY

BY GUY KAWASAKI

The Macintosh Home Office

The myth and the reality

GIVE ME A MACINTOSH, A laser printer, and a fax modem, and I'm ready to conquer the world. I don't need an office, support staff, and management. Like many Macintosh owners, I'm a home-office warrior. My commute is 30 seconds—45 seconds if I stop to get a cup of coffee in the kitchen. I set my own hours, and I don't attend staff meetings where people who don't care about anything have to listen to people who don't know anything.

I don't have to beg an MIS department to buy me a Macintosh; I can buy any Macintosh my wife lets me buy. Macintosh has made this all possible, and sometimes it seems like nirvana. But to be completely truthful, a lot of our starry-eyed visions about having a Macintosh home office are more myth than reality. Here's why.

Plug and Pray

Myth: Macintosh does not require technical support. You go to your local computer store, select a Macintosh from the distinctly and clearly positioned product line with the help of a knowledgeable salesperson, take it home, open the box, plug, and play.

Reality: Plug and *pray* describes real life. I crash at least five times a day. Now StartUp is the utility I use most often, because I spend so much time tracking down INIT conflicts. Luckily I have a friend who spends half his day scanning bulletin boards for updates and patches for the software we use, and he provides me with technical support.

Alone at the Top

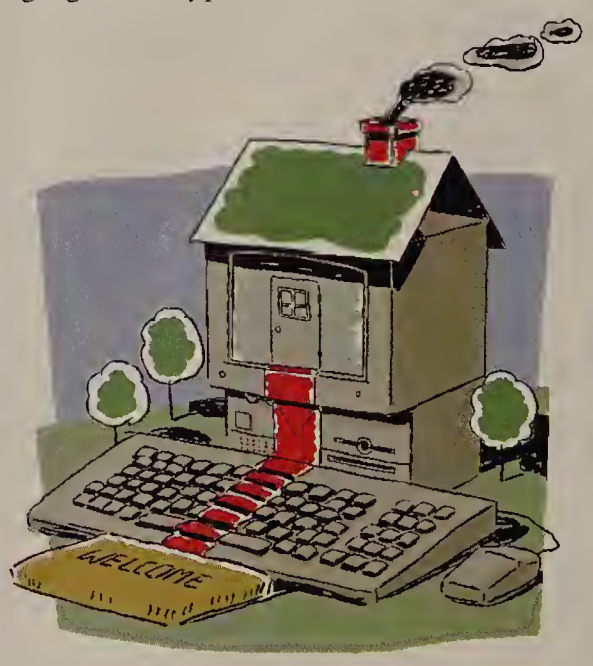
Myth: Working at home with your Macintosh means you're isolated so you can concentrate on being more creative and productive. You aren't interrupted by coworkers, and you are not at the beck and call of a manager. You can sit at your Macintosh, completely focused, in Macintosh bliss.

Reality: You can't concentrate on being more creative and productive. When your Macintosh won't print, there isn't a Macintosh dweeb to find the LocalTalk connector that came undone. Simple tasks such as printing a label, stuffing an envelope, and licking stamps are now your problems.

Furthermore, Macintosh's alleged ease of use tempts you to make everything cooler. When you work for a big, dumb company, you dash off a memo in Times and Helvetica, and everyone is impressed by your laser output.

When you work at home, you decide to integrate graphics and QuickTime movies in your document because "it should work." It doesn't.

And let's face it, Macintosh users are gregarious types—who wants to be isolated? If you've got E-mail, you don't have to be. I send my columns and books out electronically to a cadre of beta sites who are my harshest critics. I float column ideas on bulletin boards and troll for sources. I'm not isolated—in fact, because I check my four E-mail services 50 times each day, I'm inundated.



PC Jr.

Myth: Since you're at home, you don't need day care for your children. Although this myth has little to do with using a Macintosh, it is a big part of working at home. Theoretically, working at home is the best of all worlds: bonding with your children, working in bliss, and saving the money you would have spent on day care.

Reality: You need day care more than ever, because Junior has only two states—crying and being adorable. Each of these states is more attention-consuming than a screen saver. Both states are unforeseeable. Both states are unavoidable. You wouldn't think of taking your child to an office without day care, so why would you do this at home?

If you think you can get away without day care, you probably think that a PowerBook battery lasts two hours. That PowerPC is compatible with your old software. That Bill Gates needs an IRA. That Guy Kawasaki thinks about anything but royalties.

The Big Bucks

Myth: You make more money working at home. The advertisements tell you that a Macintosh home office is inexpensive: a computer, a laser printer, and some software—max, $2500.

Reality: You discover you need more RAM. And an optional tray to print envelopes. And a fax modem. And a dedicated fax line. And a PowerBook. Soon you've spent $5000.

Sure, as a Macintosh home-office warrior you can charge two or three times what a company pays an employee. However, when the dust settles, most people who work at home make the same as they would at a company, because they go nuts buying the latest Macintosh, laser printer, fax modem, cellular phone, beeper, stereo, and CDs—in the name of "enhanced productivity."

On the Other Hand

These myths aside, I am not trying to discourage you from working at home; I'm providing a realistic perspective. But your worst day as a Macintosh home-office warrior will be better than your best day at a company you don't like. **m**

GUY KAWASAKI's views are his own and only sporadically represent those of *Macworld*. His latest book is *Hindsights* (Beyond Words Publishing, 1994). He has investments in Bit Jugglers, Global Village Communication, Bookmaker Corporation, and others. He can be reached at Kawasaki@radiomail.net.

WARD SCHUMAKER


Don't lie to me.

You want the truth? Here it is. NEC's new MultiSpin® 3X CD-ROM readers are the best-performing readers on the market.

Notice, there is no asterisk to qualify that statement. No special connections are required to make our readers run at triple speed. And, you don't have to have an NEC computer or monitor. (Although it would be nice if you did.)

We were the first to introduce double speed. And now we improved our data transfer rate to 450 Kbytes/sec. and made a triple-speed reader. (Because that's what you wanted.) We also cut our access time to less than 200 milliseconds, added a 256-Kbyte continuous-flow cache, a SCSI 2 interface, and a full 16-bit SCSI card.



NEC MultiSpin 3Xp and 3Xe

OK, so now we've done what every true computer ad must do. We've filled your head with a long list of numbers and specs. But, what does it all mean?

Well, it means you can get your information three times faster than you can with standard readers, see smoother animation and video.

And then there are the really important questions. Like is our CD-ROM reader easy to use;

MultiSpin is a registered trademark and FastFacts is a trademark of NEC Technologies, Inc. NEC GSA#GS00K91AGS5241 © 1993 NEC Technologies, Inc.

how much is it going to cost me; and, will it look good on my desk? The answers are Yes, around the same that it will cost you for a 2X; and you'd better believe it.

Our new MultiSpin CD-ROM readers are not only fast but interactive and intuitive to your needs, with control and display features on the front panel that tell you exactly what's going on (or not going on) at all times. They also have stand-alone audio controls so you can play music CDs without a computer. And there's a complete line of NEC interfaces, which include easy-to-use installation software. So you won't spend half your life trying to hook your reader up.



They're compatible with Macs and PCs, as well as Kodak Multisession Photo CDs. And they come with the longest commitment in the industry – a 2-year limited warranty.

For more information on our new MultiSpin 3X CD-ROM readers, call 1-800-NEC-INFO now. Or, for immediate details via fax, call NEC FastFacts℠ at 1-800-366-0476, request document #23768.

We'll answer any questions you may still have about CD-ROM. And (this is the best part) you'll actually get to have an honest conversation for a change.

NEC

Circle 16 on reader service card

The first trackball in awards is first in something even more important.

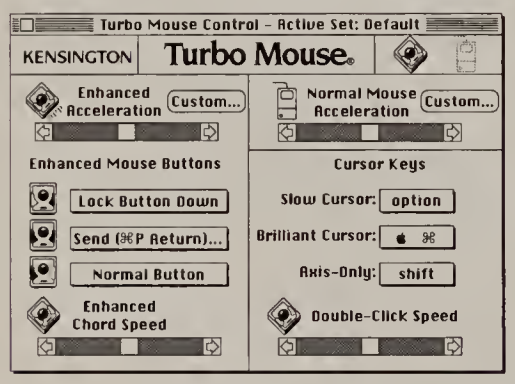
Comfort.

MacUser gave it the coveted Five Mice. The readers of *Macworld* voted it "Best Input Device" five times. It has won more awards than any Macintosh input device in history.

What makes Turbo Mouse the number one choice in input devices?

Move the ball. Click the buttons. Feel the difference.

Turbo Mouse is more comfortable than an ordinary mouse. Its superior trackball design



means less hand and arm movement: you move only the ball, not the entire device.

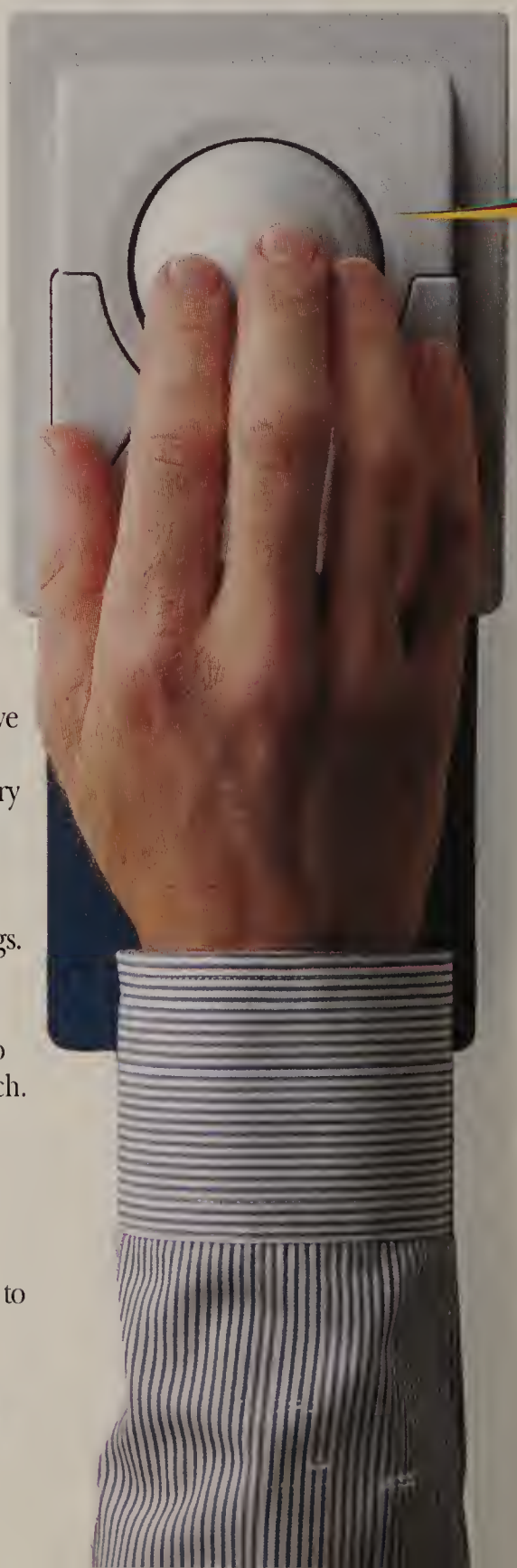
And it's more comfortable than an ordinary trackball. A unique combination of hardware and software make the difference.

Turbo Mouse has a large comfortable ball that rests on high-quality stainless steel bearings. The movement is ultrasmooth. Precise.

The buttons are also more comfortable. They are oversized, well-positioned and easy to click. Your fingers don't have to stretch as much. There is less fatigue after a day's work.

Program the buttons. Jump to HotSpots. Save unnecessary movements.

The other part of the comfort story is our unique, programmable software. It allows you to automate the functions you use most often.



Program one button as a double-click to open files and programs instantly.

Program another button to avoid holding down the button when dragging objects. Or program a button to slow the cursor down, lock on an axis or send keyboard macros. And our new Brilliant Cursor® technology even allows you to jump to predefined HotSpots onscreen, like the icons in a toolbar or palette.



And Turbo Mouse automatically remembers which application you're in. So you can program different command combinations for each application.

It all adds up to less repetitive motion. Less wasted energy. Less stress.

Kensington Satisfaction Guarantee

Turbo Mouse 4.0 comes with on screen help, two ADB ports for chaining and is fully System 7 compatible. Our unique Satisfaction Guarantee includes a 5-year warranty, toll-free technical support, and a no risk 60-day trial. For information, call 800-535-4242. Outside the US, 415-572-2700. For information by fax, call and enter 82 and request document #323.

Turbo Mouse® 4.0

KENSINGTON®

Brilliant Cursor, Turbo Mouse and Kensington are registered trademarks of Kensington Microware Limited. © 1993 Kensington Microware Limited 12/93